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The Illinois U Library

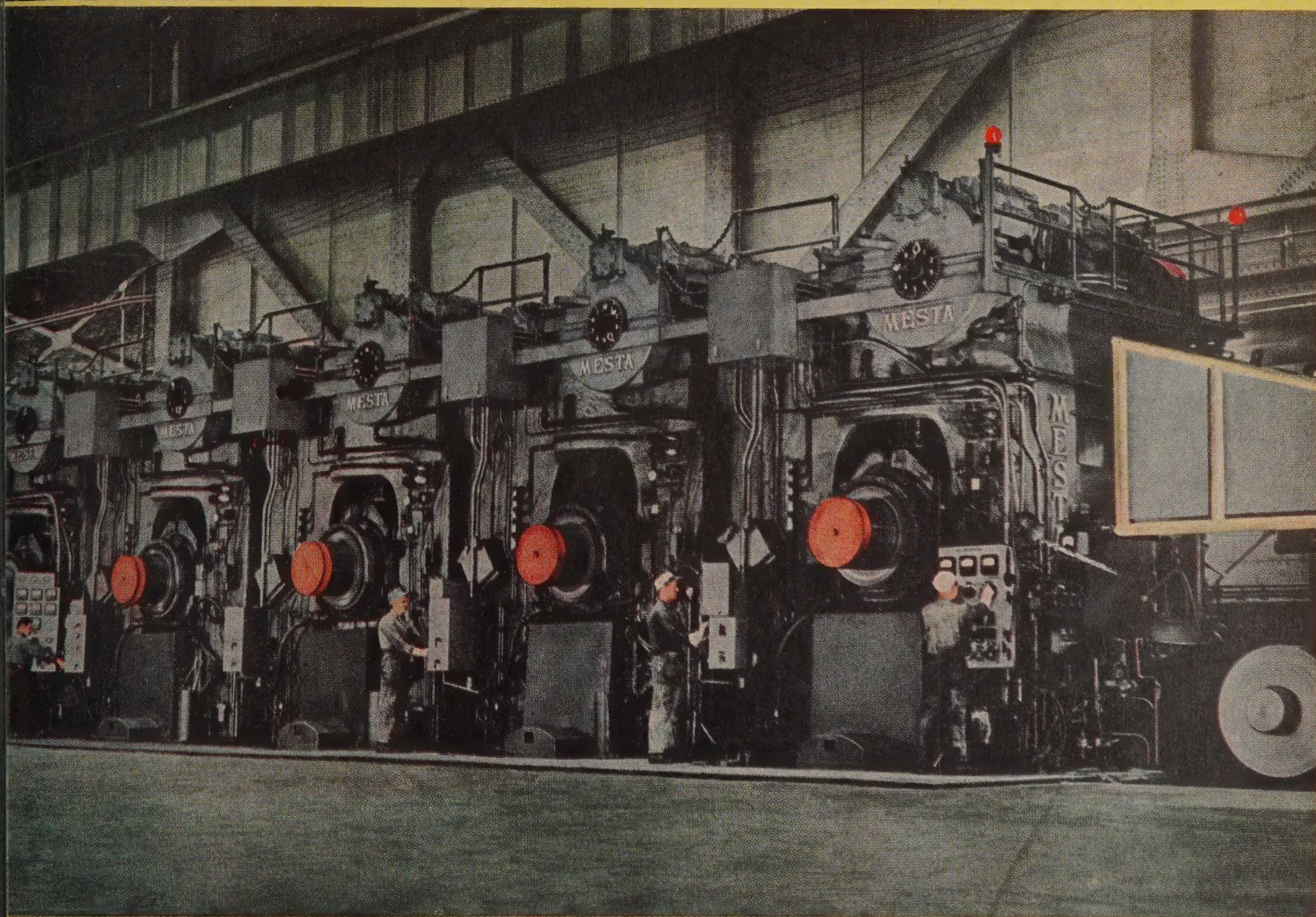
IRON AGE

SEPTEMBER 16, 1948

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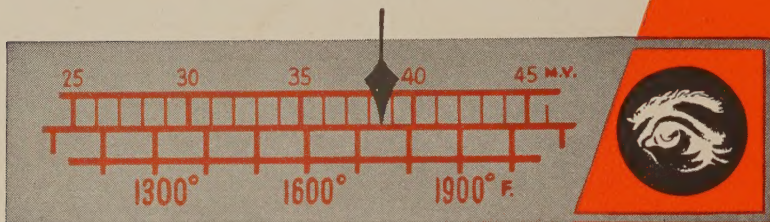
The World's Highest Speed Cold Mill . . . Mesta 42" Four-High, Five-Stand Tandem Cold Mill installed at Jones & Laughlin Steel Corporation, Aliquippa Works

COLOR PHOTO BY E. D. MESTA

DESIGNERS AND BUILDERS OF COMPLETE STEEL PLANTS

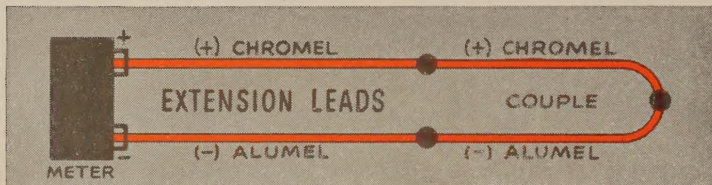
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"extension" leads with your
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Your pyrometers are probably accurate . . . most of them are today. And, too, most of them are calibrated for dependably accurate CHROMEL-ALUMEL thermocouples. But they can still register *inaccurate* temperature-E.M.F. values if you're using so-called "compensating" lead wires. Here's why . . .

When "compensating" leads are used, wires of different composition are joined together forming thermo-electric junctions just outside the furnace. When these junctions get hot . . . as they very often do . . . or when one gets hotter than the other, the opposing E.M.F.s they generate become more and more unequal . . . and serious plus or minus errors are registered by your meter.

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equipped with durable CHROMEL-ALUMEL couples. They carry a positive accuracy guarantee of $\pm 5^\circ$ between 32° and 660° F., and $\pm \frac{3}{4}\%$ at temperatures above 660° F. And, of course, protect this fine accuracy by using only CHROMEL-ALUMEL extension leads. They belong together . . . and together they eliminate all possibility of "cold-end" errors! Our Catalog—58R contains complete technical information . . . want a copy?

Additional References: Bureau of Standards Research Papers . . . R.P. 767—"Standard Tables for Chromel-Alumel Thermocouples". R.P. 768—"Methods of Testing Thermocouples". R.P. 1278—"Stability of Base Metal Thermocouples in Air at 800° to 2200° F."



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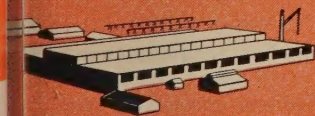
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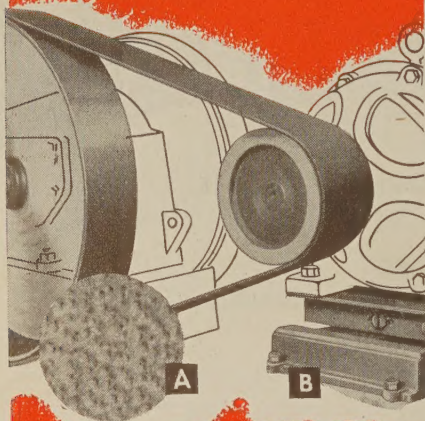
BARIUM STEEL CORPORATION

EXECUTIVE OFFICES
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HERE'S WHY . . .

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SC-26

Fatigue Cracks

BY C. T. POST

Lids Off

• • Sam Russel's Phoenix Iron Works out in Oakland, Calif., long has had the reputation of being one of the most careful foundries on the West Coast. Yet, not too long ago, six tons of man hole covers cast by Phoenix went for scrap. Joe Gomez, Phoenix night watchman, was aroused at 2 a.m. by two truckmen, who explained that they had been sent to pick up some man hole covers but had been delayed by a breakdown. Joe obligingly rounded up all the man hole covers he could find, held a flashlight so the boys wouldn't pinch their fingers in loading.

The daily papers snickered about it's being an undercover holed-up job when the theft was reported, but it took Bob Reinhardt, your favorite family journal's West Coast news detective to knock the lid off the case. Bob reports that the same day the covers disappeared, Mission Foundry & Stove Works in San Francisco was approached by some lads peddling scrap. They said they'd been doing some cleaning up and had some man hole covers just right for the cupola, at \$44 a ton.

"Sold!" said Mission. "Unload right here."

The obliging chaps unloaded, mold marks down. Not long after the truck had disappeared down the street, Phoenix' Sam Russel telephoned Mission on other business, happened to mention that some man hole covers had been liberated during the night.

"Good lord!" gasped Mission, "I think we just bought them."

And that, kiddies, is the story of why it's once again safe to walk down the streets of Oakland.

Secret Ingredient

• • "A new plastic cloth material which is stronger than steel and withstands shell fragments as successfully as armor plate has been developed," shouted the American Chemical Society, reporting on its annual meeting the other day.

"This material can be molded into automobile bodies, noiseless gears, water pipes, furniture, boat hulls, and many other useful products," the Society crowed, then began to burble about polyester plastics laminated with textiles.

Do you know what is at the bottom of this new contribution to America's military might and industrial future? Yes, papa, polyester plastics are half the story.

But, as mama could guess, the mystery textile tossed aside so lightly is Steralon, a non-woven cloth originally designed for baby's disposable diapers.

Glomerule

• • The U. S. Bureau of Mines is up a tree again in its sponge iron experiments. Your f.f.j. reports (Sept. 2, p. 155) that the Bureau has issued a booklet entitled, "Production of Sponge Iron: Gaseous Reduction of Iron Oxide Glomerules in a Shaft Furnace." Hoisting our unabridged Webster onto the desk we find that a glomerule is a botanical term meaning "an inflorescence consisting of a compacted or sessile cyme . . . a spore-dium . . . (or) in some of the smut fungi, a cluster of coherent spores." Alternately, in an anatomical sense, it's a glomerulus—"A small convoluted mass of capillaries, esp. that contained in a Malpighian capsule."

Either the Bureau has been stoking smut fungi in place of ore, or else . . . horrors . . . it's right in a class with those ax murderers who toss the torso in the furnace. If they'd come right out and said, "glob," everyone would have understood. We'd have said nothing, because our 1926 Webster doesn't list "glob."

Cermets

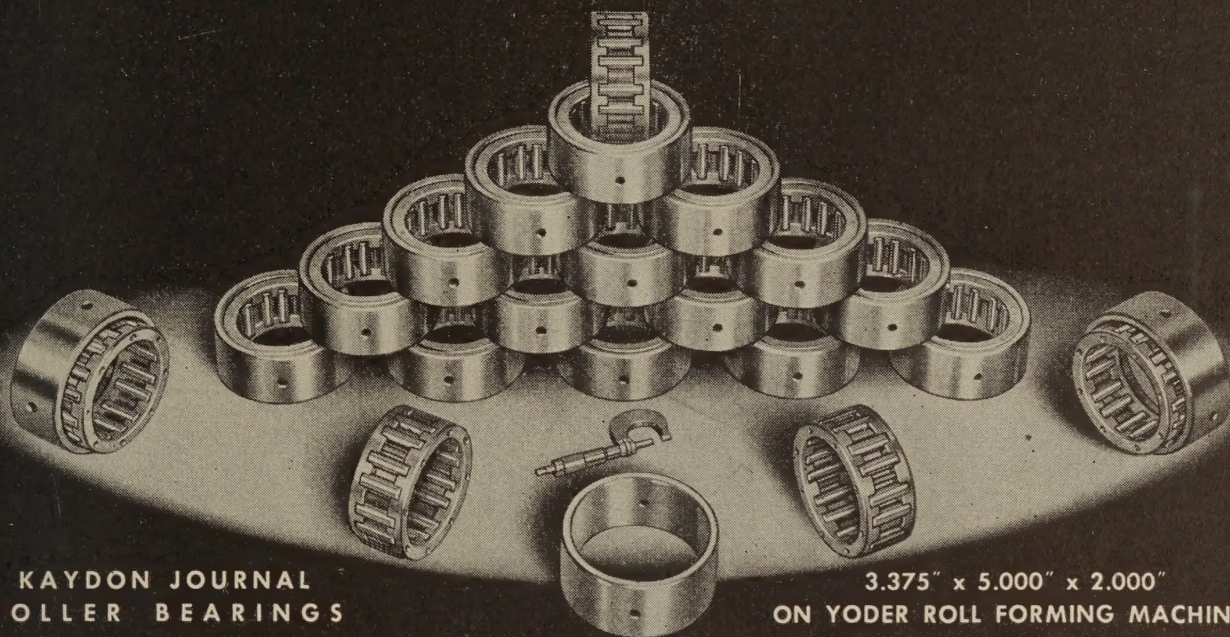
• • When we saw the letter from Corning Glass Works' Charles F. DeVoe in "Dear Editor" (Sept. 2) seeking more information on the breaking strength of cermets by thermal shock, we guessed right away what he was talking about. These affectionate little animals are sintered crossbreeds of compressed metal and refractory powders designed for service at around 5000°F. You'll find them chummy companions to have along on your rocket trip to the moon, and the scientific semanticist who crossed "ceramic" and "metal" to originate the breed should be congratulated.

Wings

• • The post office department can blame those 1920 mail trucks on the appropriations committee and get away with it. But they're going to have a tough time explaining how the Chicago postoffice stamps an envelope "insufficient postage for airplane mail." With helicopters and rockets just around the corner, the term is almost one with "horseless carriage."

Contact **KAYDON** of Muskegon

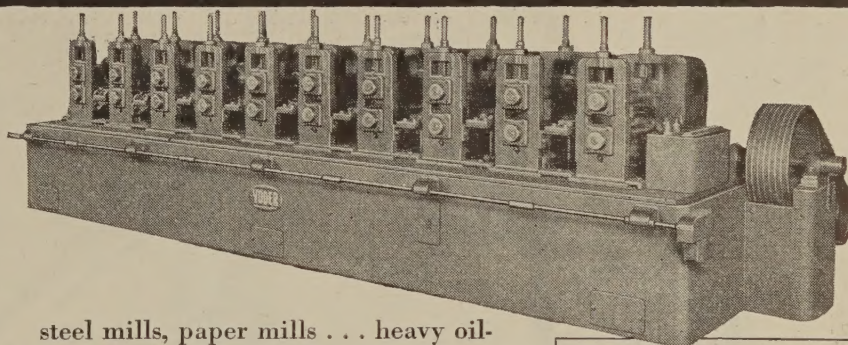
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KAYDON JOURNAL
ROLLER BEARINGS

3.375" x 5.000" x 2.000"
ON YODER ROLL FORMING MACHINES

Smooth rolling for Yoder Roll Formers



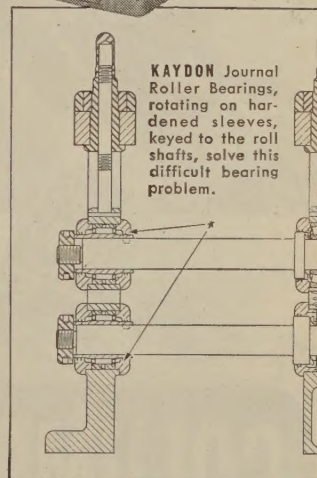
IT'S a rugged business these Yoder Roll Forming Machines are in! They take flat, heavy gauge metal strips and form them into modern moldings, tubular and angular shapes. Under the terrific loads required in the forming operations, roll shafts must operate smoothly. This calls for precision bearings of extreme ruggedness. Husky KAYDON Journal Roller Bearings meet these requirements.

In many types of heavy-duty machinery for metal working industries,

steel mills, paper mills . . . heavy oil-field and construction machinery, and similar equipment, KAYDON is helping engineers to improve performance thru advanced bearing applications.

* * *

Counsel in confidence with KAYDON. Capacity now available for all sizes and types of KAYDON bearings . . . and for atmospheric controlled heat treating, precision heat treating, salt-bath and sub-zero conditioning and treatment, microscopy, physical testing and metallurgical laboratory services.



KAYDON Journal Roller Bearings, rotating on hardened sleeves, keyed to the roll shafts, solve this difficult bearing problem.

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KAYDON Types of Standard or Special Bearings:

Spherical Roller	•	Taper Roller
Ball Radial	•	Ball Thrust
Roller Radial	•	Roller Thrust

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Dear Editor:

FORGING STEEL STRENGTH

Sir:

I was very much interested in the analysis presented in the article "Strength Limitations in the Use of SAE 4340 Steel Forgings" in the Aug. 5 issue. The relationship drawn between the laboratory test results and service experience represents one approach to the problem. It makes it difficult for the reader to assess the validity of this relationship, however, without a greater knowledge of the service failure of the large forging referred to in the article. I would like to ask if the service failure was of a fatigue nature or whether it was considered a static type fracture.

If fatigue phenomena are involved in the service failure, it is difficult to reconcile the correlation of either unnotched or notched tensile specimen data with the service failure.

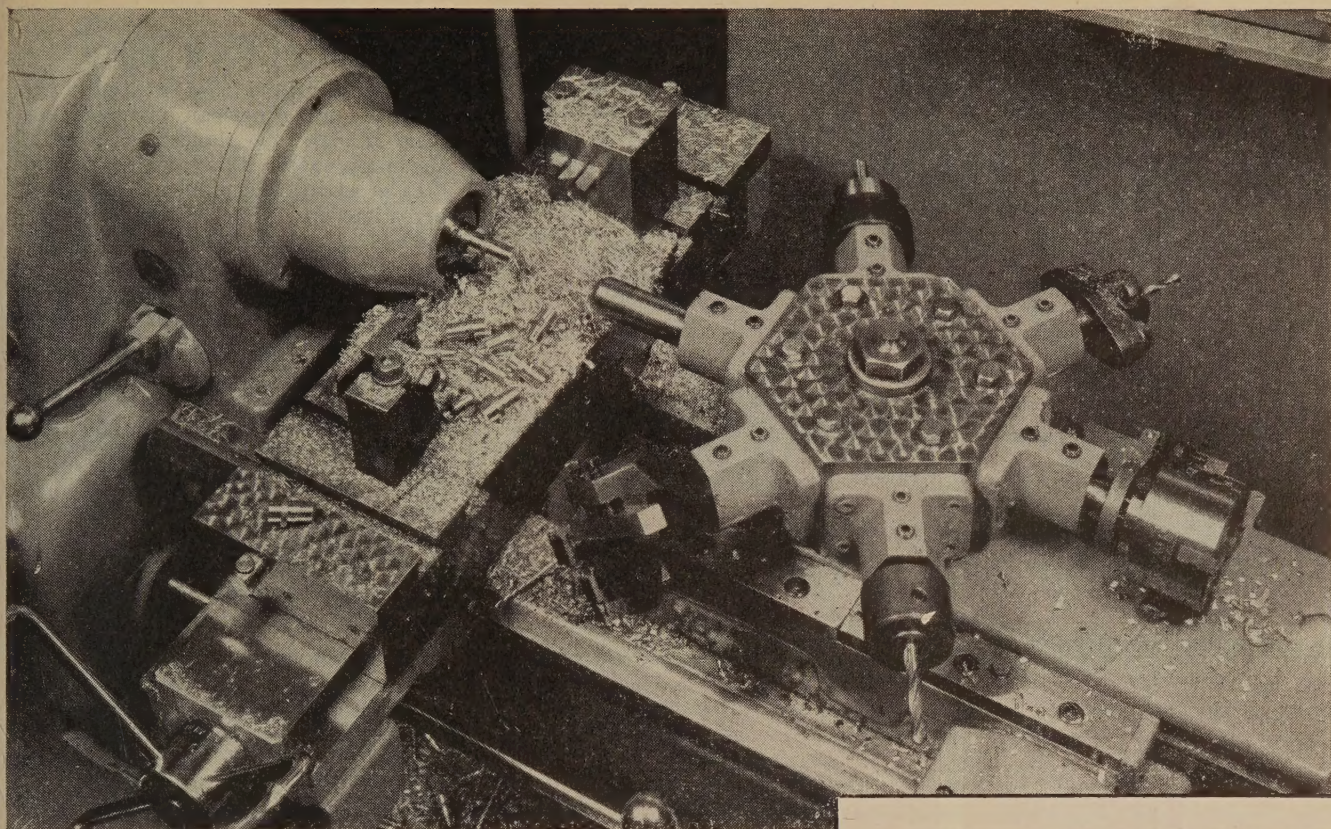
The analysis appears somewhat parallel to that used by some authors in explaining the so-called brittle fractures associated with welded ship failures. These ship failures represent very controversial issues as to the factor or factors responsible for failure. For this reason, I am skeptical of the relationship without a better knowledge of the service failure.

The tensile test data in the article on notched specimens of 0.3 in. diam is very informative, but does not justify the sweeping conclusions regarding heavy forging sections of 4340 steel. The contentions may be correct for laboratory findings, but we should have more assurance that it applies to heavy forging sections. This criticism is not intended to detract from the contribution the article makes, but it is difficult to agree with the conclusions.

OSCAR J. HORGER
Chief Engineer

Timken Roller Bearing Co.,
Railway Div.
Canton, Ohio

● L. J. Ebert, one of the authors of the article, comments as follows: "The failure which initiated the investigation was not a fatigue type failure, but rather a static failure. The forging in question failed in a brittle manner during a static proof test, and the load at which failure occurred was much lower than that for which the part was designed. We did not intend the conclusions in the article to be as sweeping as they evidently appeared to be. The conclusions were meant to apply only to heavy forgings tested and used under static conditions—the conditions for which the particular forging in question was designed. While it is true that the test specimens used in our work were relatively small, they were machined from the actual forging; and, what is more important, the changes recommended as a result of the study completely eliminated the difficulties encountered."—Ed.



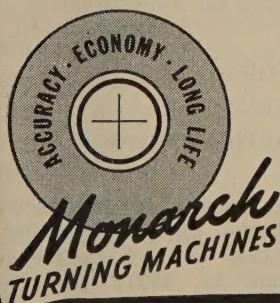
THE MONARCH SPEEDI-MATIC . . . *pays for itself in 2 years* on jobs like this

That's the record of the "World's Fastest Hand Screw Machine".

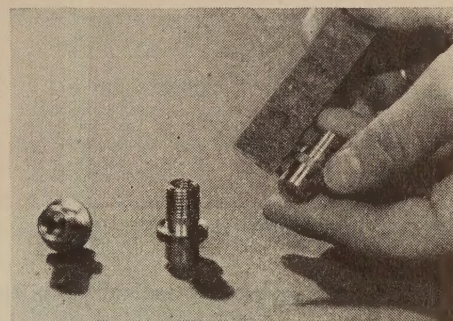
One customer, in fact, has already saved over half the price of his two Speedi-Matics in just nine months of operation—an annual return of 66 $\frac{2}{3}$ % on his investment.

Saving possibilities of the Speedi-Matic are completely realized on jobs such as the one illustrated. Extra close tolerances are held, consistently. The variety of cuts takes full advantage of the automatic electronic speed and feed change. With a spindle speed range of up to 5000 rpm maximum, very small work, the softer metals and carbide cutting tools are accommodated at top efficiency.

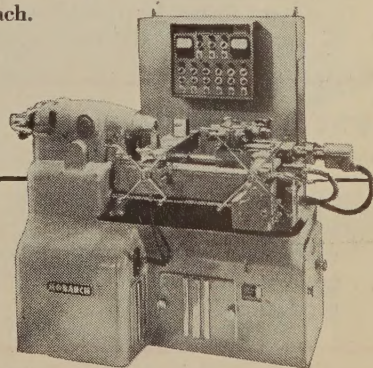
For "peak production at a profit" on jobs up to $\frac{1}{8}$ " bar stock size—and in lots as small as 25 or up to 500 and more—you can't beat the Speedi-Matic. Ask us for documented case-history proofs of this statement, illustrated in bulletin 1902.



THE MONARCH MACHINE TOOL CO., Sidney, Ohio

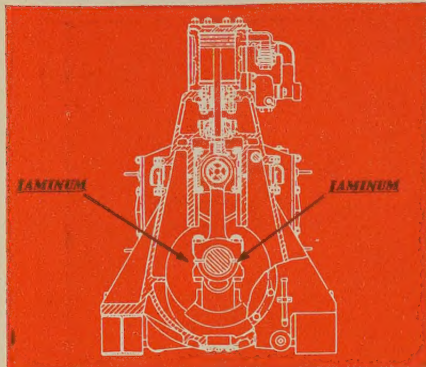


JOB FACTS: Brass adapter plug completely machined in one setup, on the Monarch Speedi-Matic, using all six turret faces, front and rear cross slides, and eight control panel stations. Spindle speeds employed include a low of 800 rpm and a high of 3800 rpm. Total time, including handling—.4332 minutes each.

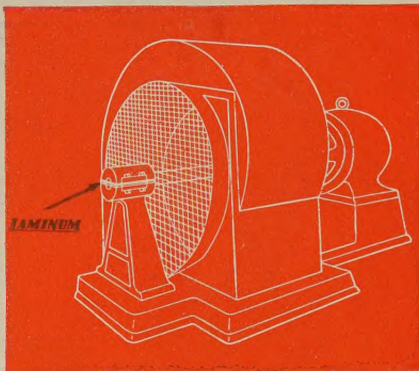


FOR A GOOD TURN FASTER — TURN TO MONARCH

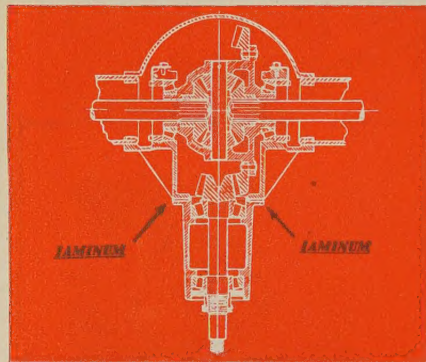
UP TO 30% SAVING IN ASSEMBLY TIME WITH LAMINUM* SHIMS!



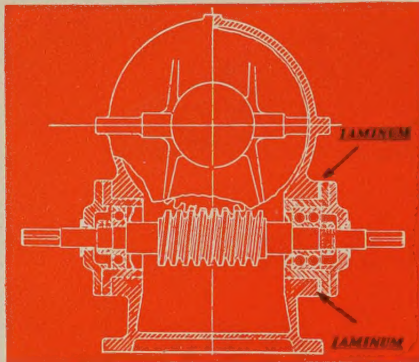
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Send today for chart illustrating 46 money-saving, time-saving applications, detailed specifications, sample of LAMINUM.

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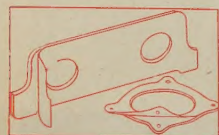
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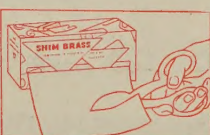
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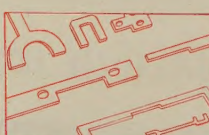
LAMINATED SHIM COMPANY, Inc.
3207 Union Street Glenbrook, Conn.



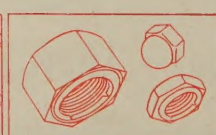
SHIMS



SHIM STOCK



STAMPINGS



AN-COR-LOX NUTS

WIRE ROPE

Sir:

We understand that a study was made by an American investigating team of wire rope plants in the Ruhr, Germany, after this last war, and that a report was published on these investigations. We should be very glad if you could inform us how we can obtain such material.

G. G. B. DAVIS
British Ropes Ltd. of London
New York

● Office of Technical Services, Dept. of Commerce, Washington, is the agency distributing such reports. They have informed us that the only releases dealing with German wire rope manufacture are the following: PB-49200 (\$13 photostat, \$4.00 microfilm), PB-49242 (\$3.00 photostat, \$1.00 microfilm) and PB-44662 (50¢ mimeographed).—Ed.

WELDING DISSIMILAR METALS

Sir:

We would very much appreciate receiving a copy of the article "Welding Dissimilar Metals with Stainless Electrodes" from the July 1 issue.

A. H. RICH
Armco Steel Corp.
Middletown, Ohio

VACUUM CASTING

Sir:

Would it be possible to obtain tear-sheets of the article "Wetherill Vacuum Casting Process" as printed in your Aug. 14, 1947, issue.

C. M. SMITH
Plant Manager
Budds Aero Castings, Inc.
Canaan, Conn.

● Tear sheets have been sent.—Ed.

MAGNETIC INSPECTION

Sir:

I have read with interest your two-part article "Standards for Magnetic Particle Inspection" which appeared in the Aug. 5 and 12 issues. It would be appreciated if you would forward tearsheets.

JUNE McCARTY
Sales Department
Brush Beryllium Co.
Cleveland

RADIO FREQUENCY HEATING

Sir:

We would like very much to obtain a copy of the article "The Practical Economics of Radio Frequency Heating" published in the June 10 issue.

HAAKON STYRI
Director of Research
SKF Industries, Inc.
Philadelphia

INDUCTION HEATING

Sir:

Have you reprints or tearsheets available of the following articles: "Power Problems in High Frequency Melting," Jan. 22, 1931; "Electric Steel Plant Refractories," Mar. 5, 1942; "Induction Heater Speeds Tube

Converting to Welded Design Cuts Costs 20% ... Speeds Delivery

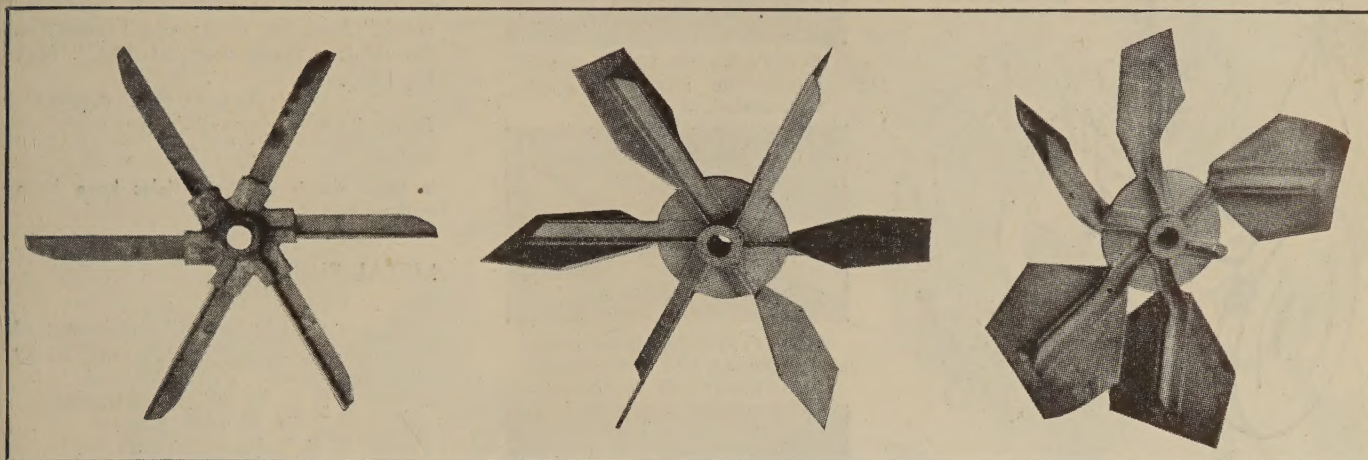


Fig. 1. Original construction. Riveted steel blades cast in iron hub. Cost approximately 25¢ per pound including riveted blades.

Fig. 2. Present all-welded steel construction. Steel blades and spokes arc welded to a steel plate hub. Cost approximately 20¢ per pound.

Fig. 3. Damaged all-welded steel impeller shows welds intact.

By W. R. Patterson, Superintendent

Dixie Manufacturing Company
Baltimore, Maryland

PART of our business is building planing mill exhaust fans for all types of industrial applications. Since each unit must be built to individual order, our shop fabricating methods must be very flexible if costs are to be held down. Arc welded construction has proved to be the only practical solution to this manufacturing problem.

Arc welding enables us to use all types of mild carbon and stainless steels with a resulting stronger product. By eliminating many time-consuming delays waiting for parts originally needed for this work, our manufacturing schedule has been cut from 4 months to 4 weeks. This prompt delivery gives us a decided sales advantage to customers requiring quick shipment.

The superiority of our welded design has already received wide customer acceptance. A number of old line customers now insist they will accept nothing but welded construction.

The impeller unit (Fig. 1) was originally constructed by casting the fan blade spokes into an iron hub. To these spokes we riveted the fan blades at a total unit cost of approximately 25¢ per pound. Under heavy load conditions, a break in the hub would cause the impeller to "explode" resulting in major damage to the blower unit and bothersome delay for the customer making repairs.

The present all-welded impeller (Fig. 2) has the blade spokes, consisting of two angles, arc welded to a flame-cut steel plate hub. The blades of shear-cut plate are welded to those spokes. The cost of the arc-welded impeller is approximately 20¢ per pound, representing a reduction in cost of approximately 5¢ per pound or 20%.

The greater strength of the welded construction is illustrated by a mishap in which a heavy block was accidentally sucked

into the blower intake. The photo (Fig. 3) shows how the blades were bent. Although the force of the mishap sheared the steel angles, the welds themselves remained intact.

The all-welded drive-shaft foundation base (Fig. 4) replaces a heavy cast base. Component parts are sheared from steel plate and assembled with arc welding, using "Fleetweld 7" and 400-amp. Lincoln "Shield-Arc" welders. A previous cast iron suction intake has been converted similarly to arc welded construction by fillet welding flame-cut plate to formed frame members.

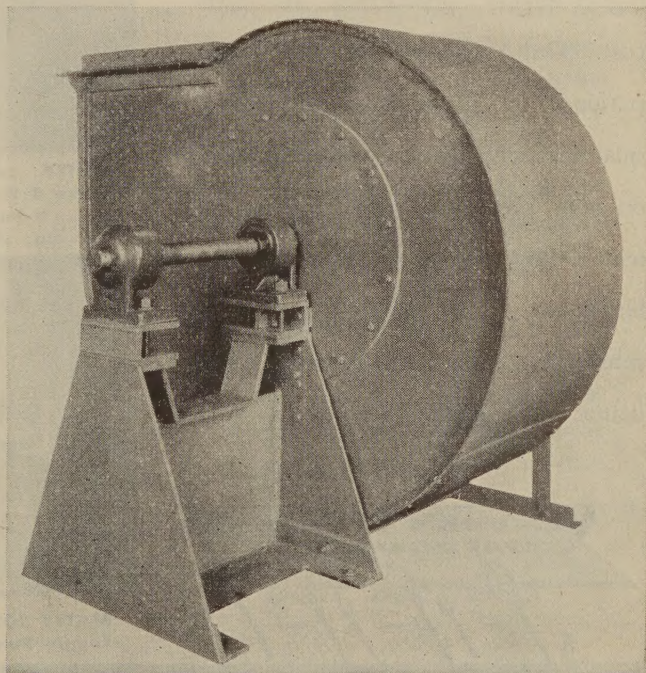
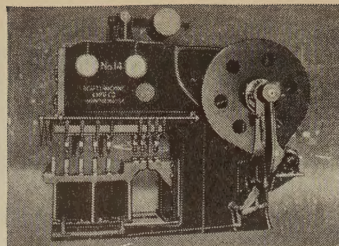
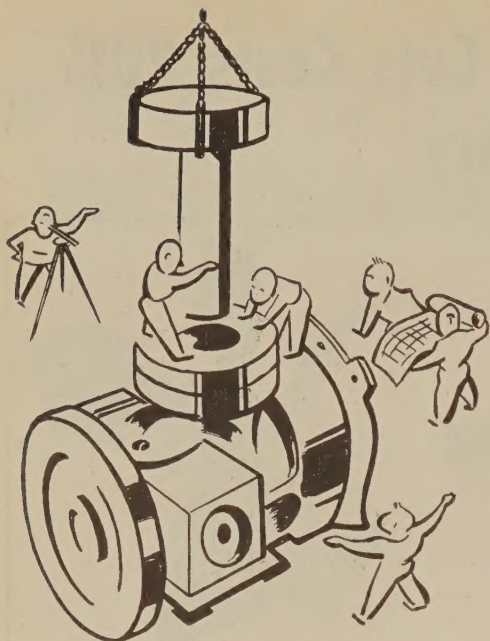


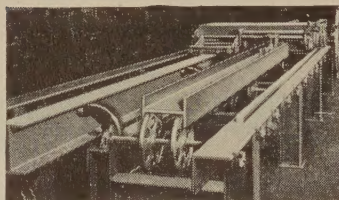
Fig. 4. Complete blower unit. Shows all-welded drive shaft base and suction intake. Cast base cost 15¢ per pound. Welded steel base cost 12¢ per pound.

The above is published by LINCOLN ELECTRIC in the interests of progress. Machine Design Studies are available to engineers and designers. Write The Lincoln Electric Company, Dept. 610, Cleveland 1, Ohio.

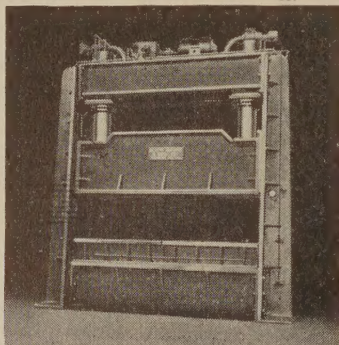
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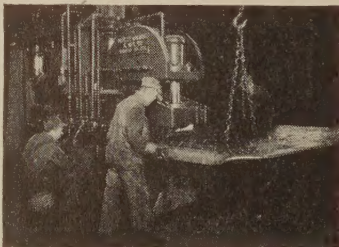
BEATTY No. 14 Toggle Beam Punch for structural steel fabrication.



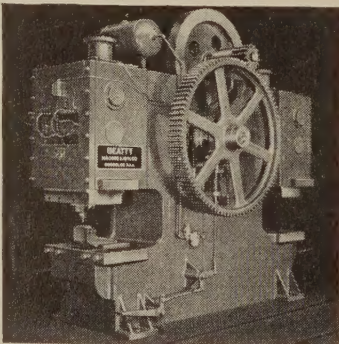
BEATTY Spacing Table handles flange and web punching without roll adjustment.



BEATTY Hydraulic Vertical Bulldozer for heavy forming and pressing.



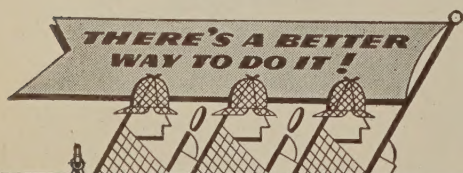
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Forming," Sept. 23, 1943; "Induction Heating," Oct. 21, 1943; "New Methods and Techniques in High Frequency Heating," Oct. 19, 1944; "Induction Brazing and Soldering," Aug. 9, 1945; "Induction Heating of Small Parts," Sept. 27, 1945; "Case-hardening Wrist Pins with Induction Heat," Jan. 30, 1947; and "Induction Hardening Steel Bars at J&L," May 15, 1947.

HOWARD W. VANGE

*General Motors Corp., Process Development Section
Detroit*

● Tear sheets of the articles have been sent.—Ed.

METAL FINISHING

Sir:

Please supply us with one copy of your "Metal Finishing Manual" at \$3 per copy.

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Sir:

Mr. E. H. Forsstrom, Assistant Plant Manager, is interested in the article "Oxygen in the Electric Furnace," Aug. 5 issue, and would be pleased to have three copies.

G. R. REINDEL

*Office Manager
Allegheny Ludlum Steel Corp.
Brackenridge Pa.*

WELDING ROD COATINGS

Sir:

We would appreciate receiving tear-sheets of the article "Identifying the Constituents of Electrode Coatings" that appeared in the April 19, 1945 issue.

C. V. APPEL

*Bauer Bros. Co.
Springfield, Ohio*

● Tear sheets have been sent.—Ed.

FRENCH STEEL INDUSTRY

Sir:

We would like to receive three copies of the article "French Alloy and Tool Steel Industry" which appeared in the July 1 issue.

H. R. DAUR

*Stahl-Contor
Zurich, Switzerland*

CONTINUOUS CASTING

Sir:

Please send tearsheets of the article "Continuous Casting of Semi-Finished Steel" from the Aug. 19 Issue.

GAYLE DAHMER
Research Librarian

*American Smelting & Refining Co.,
Research Dept.
Barber, N. J.*

LOCKWASHER TORSION TEST

Sir:

In your Aug. 5 issue, there is an article, "Lockwasher Torsion Test Improved," that we are very much interested in. Would it be possible for



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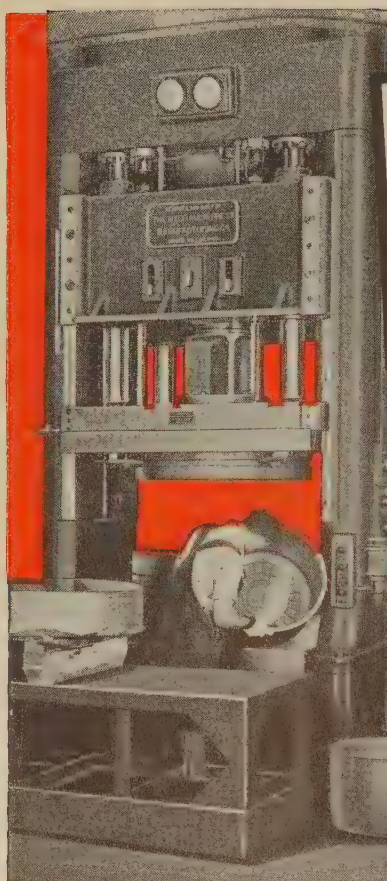
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Metallurgist

Detroit Diesel Engine Div.,
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● H. C. McDaniel, Technical Press Bureau, Westinghouse Electric Corp., Pittsburgh, can give you further details.—Ed.

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Sir:

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CARL ENGSTROM
Plant Manager

Royal Metal Mfg. Co.
Chicago

TIME STUDY COMPUTATIONS

Sir:

It will be greatly appreciated if you will send a copy of the article "Right and Wrong of Time Study Computations" as published in the issue of Aug. 17, 1944.

R. G. FENNEMA
Production Control

E. W. Bliss Co.
Salem, Ohio

● Tear sheets have been mailed.—Ed.

PRODUCTION INCENTIVES

Sir:

We would appreciate your forwarding a copy of the article "Bonus Based Upon Production Value" from the July 1 issue.

A. S. RUMMELSBURG
Plant Superintendent

Eveready Hardware Mfg. Co., Inc.
Brooklyn

POROSITY IN ALUMINUM

Sir:

In your issue of Nov. 20, 1947, there was an article "Carbides, Nitrides and Porosity in Aluminum." I would appreciate receiving tear sheets.

P. A. GOBEIL
Metallurgical Engineer

Dominion Foils (Canada) Limited
Quebec

● Tear sheets have been sent.—Ed.

PRECISION CASTING

Sir:

Enclosed please find a postal note for \$1 in payment for a copy of your booklet "Precision Investment Casting—Lost Wax Process."

WILLIAM D. MANLY
Department of Metallurgy

University of Notre Dame
Notre Dame, Ind.

TOOL STEEL CHARTS

Sir:

Will you please send two copies of your charts "Comparative Tool Steel Brands" as published in the July 29 issue.

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Purchasing Agent

The Stanley Works
New Britain, Conn.

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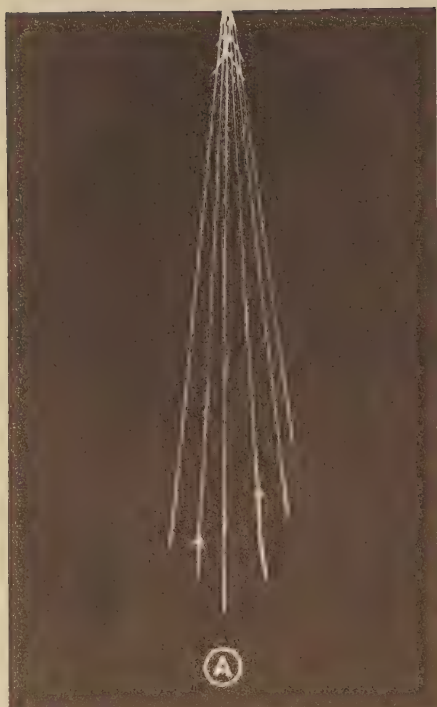
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Mark your answers here. Carbon content of steel A. is ____% B. is ____% C. is ____% Correct spark readings are given at lower left

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Gentlemen Of The Cloth

IN the city of Amsterdam on September 3rd the World Council of Churches, representing approximately 150 distinct Christian denominations, passed the following resolution: "The Christian churches reject the ideology of both communism and laissez-faire capitalism and should work to draw men away from the false assumption that these extremes are the only alternatives."

We do not know what the churchmen assembled at Amsterdam meant by "laissez-faire capitalism" and we strongly suspect that these gentlemen of the cloth did not know either. If they mean a society in which each individual is free to develop his acquisitive impulses without regard for the general welfare or the rights of other individuals, they are referring in fact to a society which does not exist this side of the jungle.

The great text which turned world opinion against the bureaucratic absolutism and sterile collectivism of the previous historic cycle was Adam Smith's Wealth of Nations. It was published in 1776, the very year in which the American colonies declared their independence. At that time England was ruled politically by a limited constitutional monarchy subject to substantial power exercised by a Parliament the lower branch of which was freely elected. The government of England was a typical Anglo-Saxon sovereign recognizing limitations upon its own powers and conceding a vital residue of individual rights inviolable either by the state as an entity or by electoral majorities.

Furthermore - and this is of importance in view of the dictum of the Amsterdam churchmen - the government even during the period when the Wealth of Nations enjoyed its greatest influence never renounced or qualified the paramount role of its authority. There was never a business group so influential either by virtue of great wealth or position that it transcended the power of the state. Big business, even in the brightest days of so-called laissez-faire, was always subordinate to the state itself and the broad public interest which it represented.

During the very heyday of primitive capitalism, if we may so term the surge for freedom which broke the fetters of the Middle Ages, a group of founding fathers in this country formulated a basic code containing among other things the Bill of Rights which both the state and the employer had to recognize - and in fact have recognized for more than a century and a half. The men who wrote the Constitution - rugged individualists and laissez-faire capitalists - were Christians recognizing the supremacy of God and invoking His blessing. With the light of this Christian faith they sought to fashion a commonwealth dedicated to peace, individual dignity and "the greatest good to the greatest number." It is a matter of indisputable record that the common man during this period of capitalism has made greater material progress than in any similar period in history.

The action of the churchmen, impartially plastering with their anathema both capitalism and communism, reveals a willful ignorance of history, a culpable misapprehension of capitalism. It suggests a distinct dose of that ideological hooch which in some quarters today passes for liberalism. An uglier suspicion still that these professional stewards of the Christian faith have succumbed to a pagan dogma whose object is world dominion and human enslavement.

Joseph Stagg Lawrence

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► The auto firm which several months ago promised dealers an extra car for each ton of scrap furnished is still far behind on "scrap" cars. Those dealers who jumped in first and supplied the scrap made out well on extra cars -- but got nowhere near the car per ton of scrap promised. But they are on record to get additional cars as the company can furnish them. Their credits run into 1949 or 1950.

► Nylon gears and bearings are being used increasingly to replace both metal and phenolic parts. Nylon works well against metal, requires no lubrication and is quiet running. The parts are especially suited to light load, low speed work and are being used in a variety of applications that range from baby-buggy wheels to electric shavers.

► Where there's a will there's a way. And where there's ore, coke and a blast furnace there can be pig iron. And where there's pig iron there can be finished steel. At least that's what one engaging entrepreneur, erstwhile of the legal profession, figured out. As a result, he now supplies ore and coke for a well known blast furnace in return for which he gets about half the output of pig iron which he trades for finished steel. Sounds like a merry-go-round but it's really conversion.

► The British automobile industry has been told that it must not expect an increased steel allocation until there is a substantial increase in the production of steel. This statement, which was made by the Minister of Supply, has been received with dismay by car manufacturers. It had always been understood that if the export effort of the industry came up to expectations more steel would be available. Since the export effort has more than justified an increase, they will continue to press for a bigger share of the steel available.

► Magnetizing parts in several directions at the same time for inspection purposes has been accomplished by a manufacturer of inspection equipment. This method permits parts to be inspected for defects in any direction with one magnetization and visual inspection instead of the usual two or more magnetizations and inspections which have been required in the past.

► U. S. Rubber chemists claim that today's tires are 3 times better than the 1918 tires and 6 times better than the tires of 1906. For a new synthetic rubber tread processed at 410°F instead of 125°F, they claim a further increase in tread life of 30 pct.

► Today we are entering the vague field of applied air power where there is no precedent. Military men would like to get an airplane from which they could drop the fuselage with a platoon of men at a speed of 120 to 150 mph about 10 ft above the ground and decelerate it with rockets. This would do away with all the problems of parachuting and attendant dispersion. As far-fetched as the plan might seem, it is not far away but rather well within capability.

► The Brazilian National Steel Co. is really paying dividends, both from the standpoint of production and profits. The company first started operation about the middle of 1946 and is now on firm financial footing. Dividends totaling almost \$4 million were paid stockholders for the first half of 1948. The profits were divided between the Brazilian Government which holds 57 pct of the shares and 43,000 private stockholders who hold the remaining 43 pct.

► The variety of stainless steel prices now being quoted may soon be cut down as were those on electrical sheets. Intense competition in the stainless field, despite good demand, plus time to make more exact cost studies, will probably result in some price reductions.

► A new sintered carbide alloy developed in cooperation with manufacturers of high speed planers is said to cut twice as long on this type of machine tool without sharpening.

► One of the large automobile manufacturing plants is using a device called a Cavitometer for 100 pct inspection of cylinder head cavities in its engines. The machine which operates on electrosonic principles inspects 150 cylinder heads per hr and detects differences in volume capacities of 1 part in 1500. Sensitivity to volume changes in the cavities is said to be 1 part in 50,000.

► ECA administrator Paul Hoffman is strongly against any further dismantling of Bizone German industrial plants. His contention is based on the fact that it would be foolish to destroy the German iron and steel industry at a time when the Marshall Plan is allocating steel to German heavy industry.

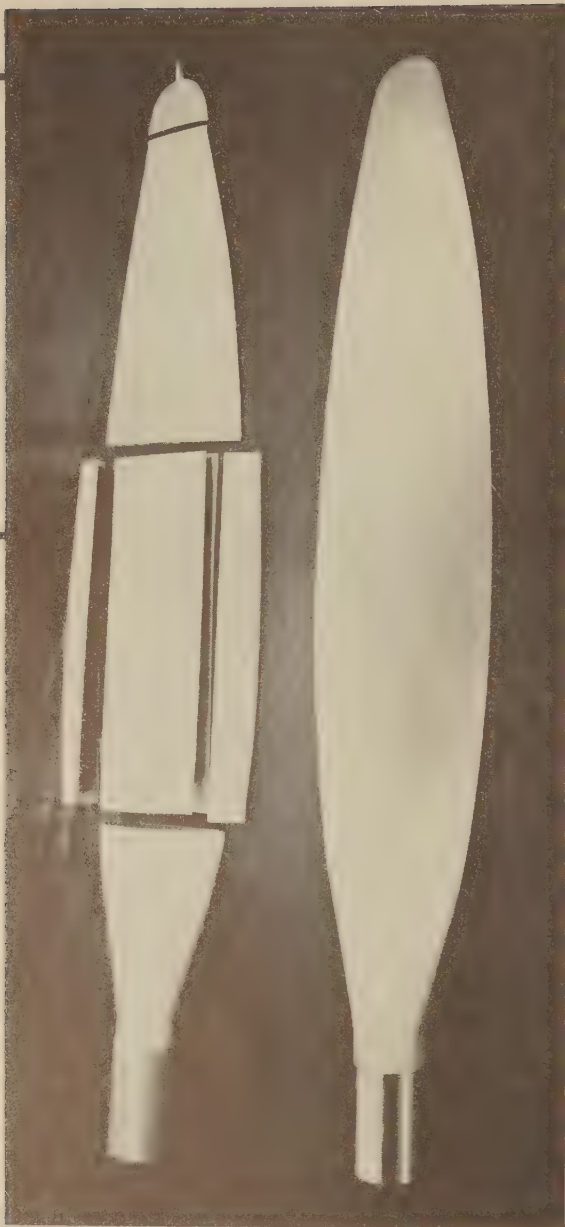


FIG. 1 - Hollow propeller, of a modified AISI EF4140 aircraft quality steel, as produced by A.O. Smith Corp. Blade sizes range from 6 to 12 ft long and vary in weight from 65 to 300 lb. Parts are forged and then flash welded together.

By RICHARD M. HORTVET
Furnace Engineer,
A. O. Smith Corp.,
Milwaukee

Special Furnaces

Production of hollow steel aircraft propellers demands precise timing of all heating phases of the processing, as well as close control of the surface condition of the part. This article describes the design, construction and operation of four furnaces developed specifically for processing propellers. Many of the design features of these units represent important departures from normal furnace design and have proved eminently successful in solving some of the problems of atmosphere and temperature control in high temperature operations.

WHEN A. O. Smith Corp. was planning the production of hollow steel propellers of the type shown in fig. 1, one of the major problems it faced was to determine the best method and type of equipment to heat the propeller sections for forging and heat treating. The standard furnace field was carefully surveyed, but because satisfactory equipment was not available, the decision was made to design entirely new furnaces of the type described in this article.

Considering the size, shape, and extremely close limits to be held in the forging operations, it was decided to use atmosphere control to eliminate scale. The design of furnace finally chosen was the rotary type, with individual muffles for each piece of stock being heated, thus insuring uniform temperature and positive atmosphere control. Two types of furnaces were selected, one design incorporating horizontal muffles and the other employing vertical muffles. The horizontal muffle furnaces were built in two sizes of eight and eleven muffles, while the vertical design had seven or eight muffles. The muffles are of silicon carbide, with walls $1\frac{1}{2}$ -in. thick, have an 18-in ID, and a 42-in. heating zone. Four longitudinal rings and an end plate cemented together with a non-hardening cement constitute the construction of the muffles. A flat hearth of silicon carbide is installed within the muffle, as shown in fig. 2, to serve as a wear plate and to absorb cold shock from the material being charged, thus eliminating cracking of the muffles.

Developed For Producing Hollow Steel Propellers

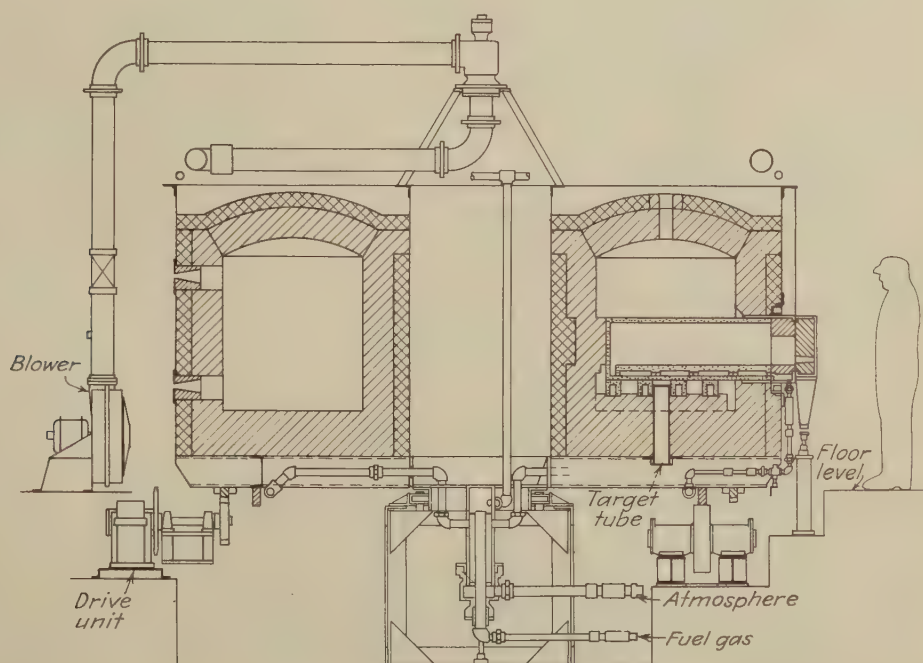
Muffles are heated to 2350°F and, under continuous operation, an average life of six months is considered good; however, some have been in service for nine months. The mounting arrangement of the muffles is designed so that they can be replaced entirely from the outside. Cross-section of the horizontal and vertical furnaces are illustrated in figs. 2 and 3.

The basic design of the furnaces originated with A. O. Smith Corp. However, units were manufactured and installed by Surface Combustion Corp., Toledo, and Lee Wilson Engineering Co., Cleveland. Each design used by these manufacturers employs a different method of firing, using Butane (3200 Btu) as fuel. In one type, fig. 5, the burners fire tangentially over the muffles. In the other design, the burners are mounted half on top of the muffles and half on the bottom and fire radially. Both methods of firing appear to give equal results as to temperature uniformity and heating capacity.

Temperature is controlled by Rayotubes which sight on closed-end silicon carbide target tubes. Two methods of locating the Rayotubes are used. In one of the designs the furnace is in two sections, with a water seal separating the top section from the bottom. The upper half, including the arch and side walls, is stationary to a point immediately below the burners. The bottom half, which includes the muffles and door mechanism, is the only part that rotates. The target tubes are stationary in this application, and control the temperature of the furnace chamber. Two zones of control are provided.

In the other design, the target tubes are mounted under the furnace, one for each muffle. In this application there is one stationary Rayotube sighting upward into the individual Rayotube as they are indexed over the Rayotube. The target tubes are positioned very close to the muffles, thereby giving a more accurate reading of the muffle temperature. While the furnace

FIG. 2 - Cross-section of a horizontal muffle furnace.



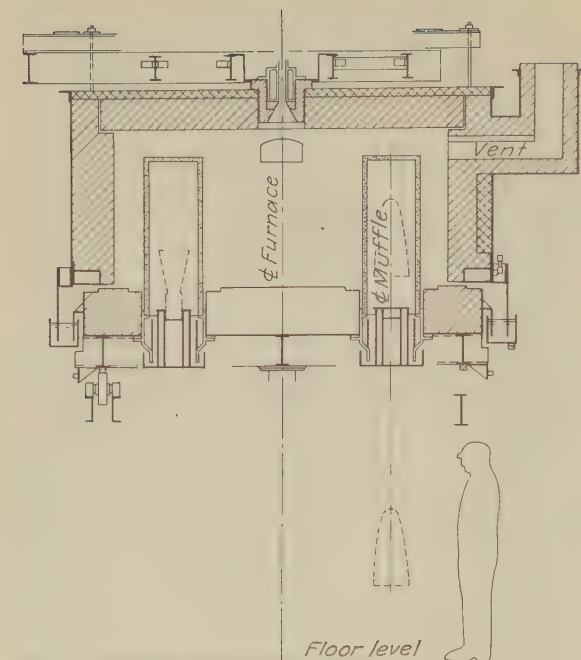


FIG. 3 - Cross-section of a vertical muffle furnace.

is rotating from one target tube to the next, the controls cease to operate and the burner setting does not change until the next target tube is positioned and sighted upon. Zoning of this design is not possible because the burners rotate with the furnace.

The doors are operated by an air cylinder to insure a minimum loss of protective atmosphere, the contact surfaces between the door and the frame are machined. The doors of the furnace are the vertical sliding type which lower when opened. This arrangement eliminates the sudden rush of cold air across the hearth when the door opens, and also insures the operator a bet-

ter view into the muffle while the door is being lowered. The seal between the door frame and the muffle is maintained by four coil springs, which also allow for expansion of the muffle. The atmosphere inlet to each muffle is located at the front under the hearth tile. Gas is forced toward the rear of the muffle where it enters the heating zone. It then moves toward the front, completely purging the muffle, and passes out through a small hole in the door. While the doors are closed, a pre-set volume of atmosphere enters each muffle. As each muffle is rotated to the discharge station, a second valve is opened, which increases the flow while charging and discharging. This additional volume is maintained for approximately 30 sec after placing the stock in the muffle. This cycle facilitates complete purging before the piece shows color. A flow-scope is provided to indicate the volume of atmosphere entering the muffles. The correct rate of atmosphere flow was determined by trial, and is approximately 10 cu ft per min while heating and 25 cu ft per min during the purging period.

The cycling operations are controlled by time clocks which automatically start and stop the rotation of the furnace. A red light indicates to the operator when to remove the heated piece.

Through the use of individual muffles, it is also possible to provide more accurate control of the protective atmosphere for each piece of stock being heated. In a single-chamber furnace there is always the possibility of diluting the atmosphere when the door is opened, causing the other pieces in the furnace to be affected.

When the initial design of the furnace was being made, consideration was given to the heating capacity of the silicon carbide muffles. Under operating conditions, they were found to equal any open-fired chamber. A temperature drop of approximately 50°F was indicated from the outside surface to the inside of the muffles. The total burner capacity of the 11 muffle horizontal type furnace is 6,000,000 Btu per hr.

The refractory lining consists of 9 in. of 3000°F insulating fire brick, backed up with 4½ in. of block insulation. As illustrated in fig. 2 and 3, two different types of heating chambers were used: One design employed the open chamber, or "table type," and the other a "donut style." From a heating and operating viewpoint, both designs functioned with equal efficiency. The firing arrangement of the donut type, in which the burners rotate with the furnace, necessitated the use of center swivel joints for the connection of combustion air, gas, and protective atmosphere.

The vertical furnaces, figs. 3 and 4, were designed and used for obtaining gradient heats on tubing. They follow the general arrangement employed in the horizontal furnaces, except that the muffles are installed in a vertical position. The furnace is supported on columns of sufficient length to give head room beneath the furnace for charging and discharging. The stock to be heated is placed on a platen, which is refractory lined and water cooled. The platen is lifted up into the muffle by a hydraulic cylinder and automatically locked into position. The hoist is then dropped for the next cycle. To control the heat length on the piece, loose silicon carbide stools of

TABLE I

Floor Space Requirements and Production Rates
FLOOR SPACE REQUIRED

Rotary forge furnace, horizontal muffle	18'-0" x 18'-0"
Rotary forge furnace, vertical muffle	15'-0" x 15'-0"
Normalizing furnace	15'-0" x 20'-0"
Quenching furnace	5'-0" x 5'-0"
Nitrogen generator	10'-0" x 30'-0"

RATE OF PRODUCTION

	Pieces per hr	Lb per hr
	20	2100
Rotary forge furnace, horizontal muffle		
Rotary forge furnace, vertical muffle	25	1250
normalizing furnace	10 blades	650
Quenching furnace	1 blade per hr per furnace	65

different thicknesses are placed on the platen. Because of the odd shape of one piece to be heated, it was necessary to use a 38 Ni—18 Cr alloy steel casting to support it. In spite of the high temperatures encountered, the castings last from 450 to 500 furnace hours. The protective atmosphere enters around the inside diameter of the muffle, passes up to the top, then down through the inside of the piece being heated, and out through a hole in the center of the platen. This method gave fast and complete purging before the very thin stock began to show color.

All handling equipment for these furnaces is designed for very fast transferring of the material from the furnace to the press in order to keep the scaling at a minimum. These furnaces have $\frac{1}{4}$ in. plate for the casing, and all structural parts, drive mechanism and operating equipment are of heavy construction. The pit, under the horizontal furnace, is of ample height to allow a man to stand erect and move with ease while oiling or making adjustments to the drive or Rayotube assemblies.

Data on floor space requirements and production rates of these various furnaces are given in table I.

The protective atmosphere used in all heating operations is nitrogen, because of its general adaptability. One installation has thirteen 8000 cu ft per hr generators all feeding into a main

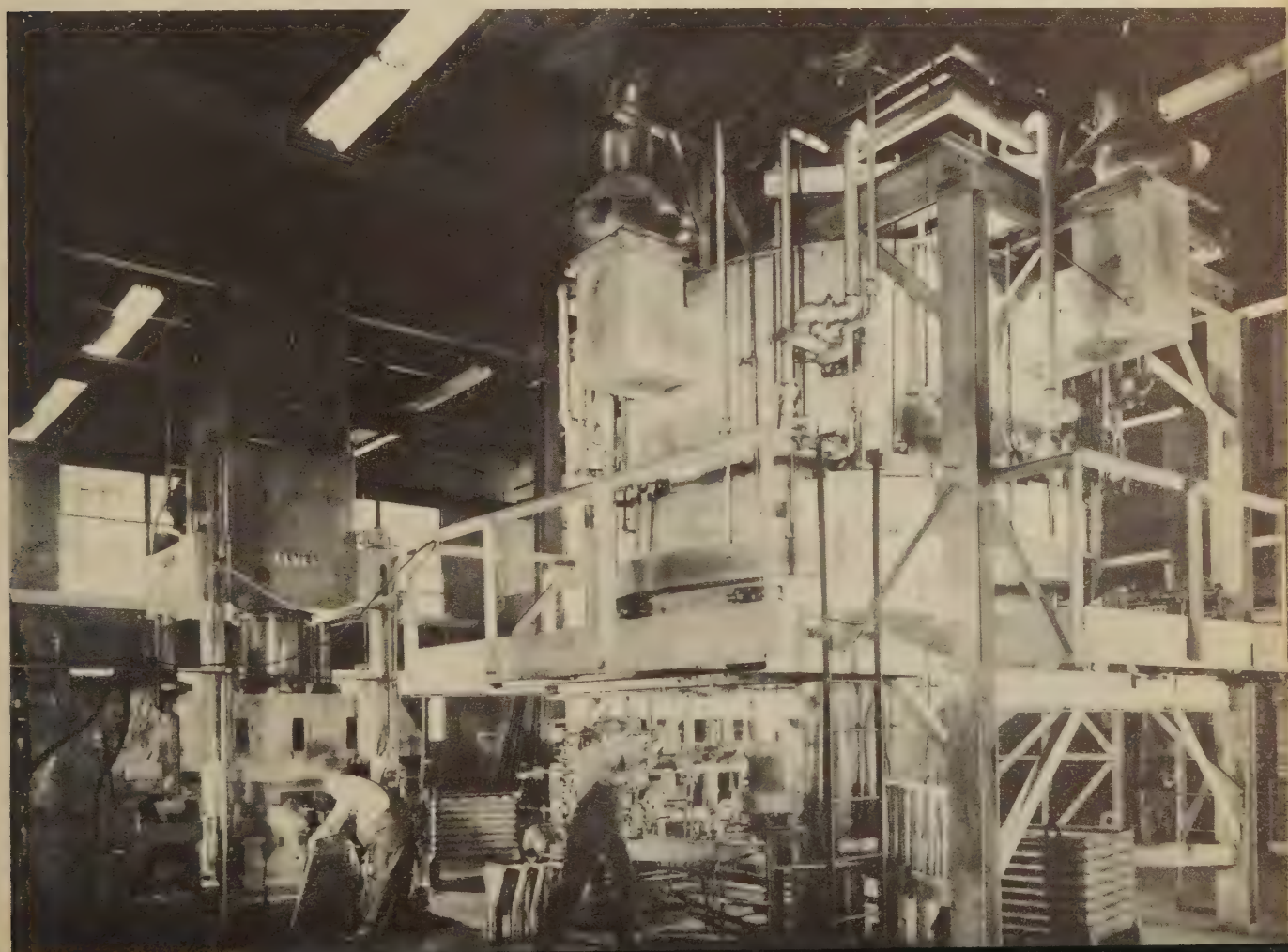
manifold from which the nitrogen is piped to various furnaces. These generators were manufactured by the Surface Combustion Corp.

Another installation uses two Westinghouse Electric Co. 8000 cu ft per hr units. The nitrogen produced in these two units is compressed in receiver tanks at 125 lb pressure. The reason for compressing and storing the nitrogen was to have ample volume on hand to complete all heats in the furnaces in case the generators failed for any reason. This was a very necessary precaution, because at this stage of production the blades are in the completed form and the loss would be considerable if they became scaled.

These two designs of generators operate on the same principle and give the same end result. The CO_2 is absorbed in monethanolamine, and the final gas is dried to an average dew point of minus 45°C . Both manufacturers used refrigeration together with activated alumina driers to obtain the desired dew point. The final analysis of the nitrogen used is as follows: CO_2 , 0.0 pct; O_2 , 0.0 pct; CO , 1.25 to 1.50 pct. Laboratory checks on the gas analysis are taken twice each day, and titration of the MEA solution three times a week. The solution is maintained at 10 to 15 pct.

After the various pieces are completed and welded into final form, the blade is normalized prior to the quenching heat. The two normalizing furnaces (see fig. 6) were designed specifi-

FIG. 4 - Vertical muffle furnace in operation. A heated shank is being removed from the furnace by the operator at right.



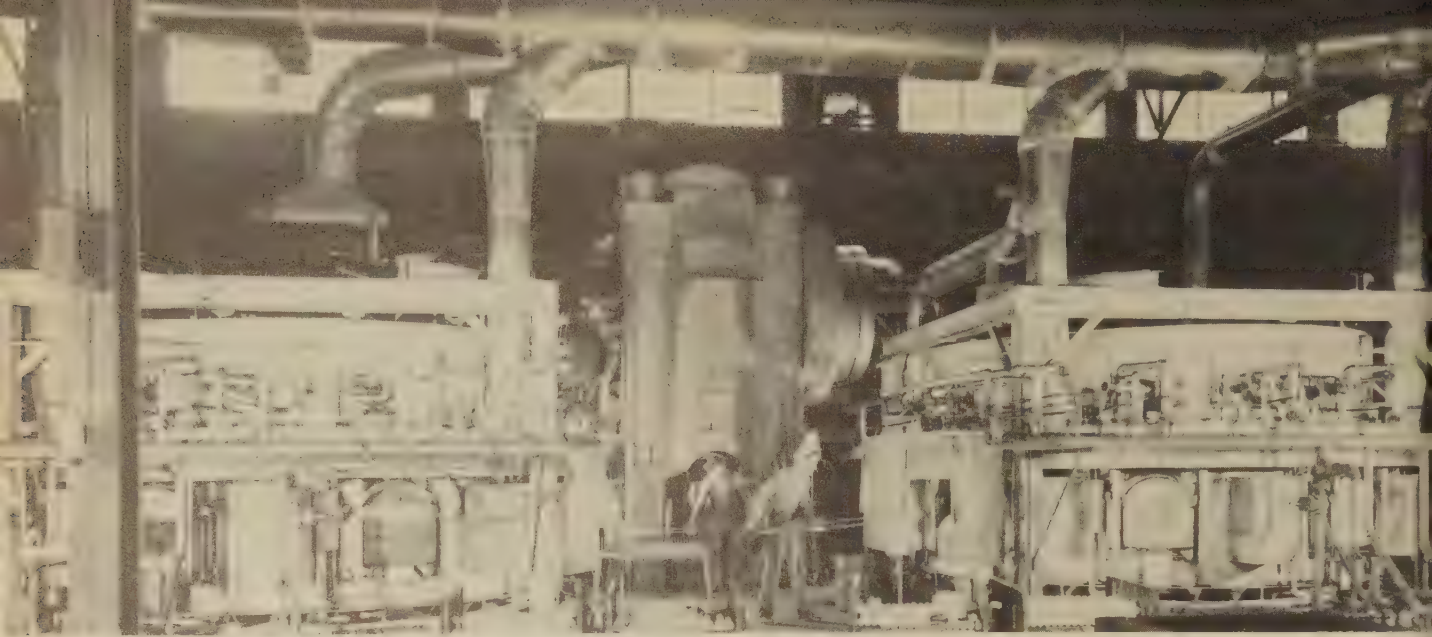
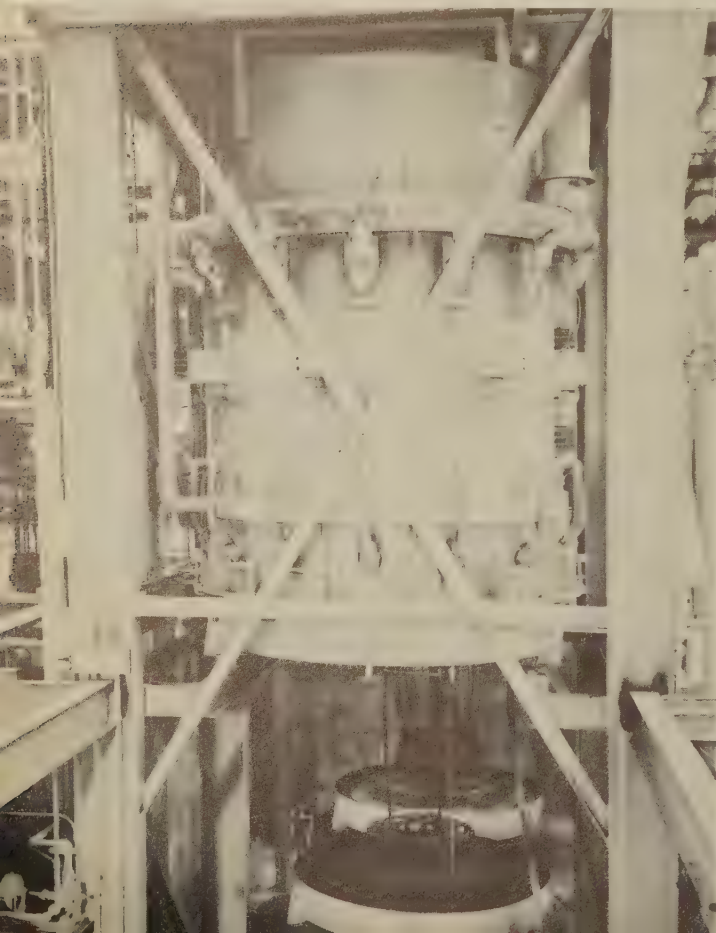


FIG. 5 - Two of the 11-muffle rotary forge furnaces which serve the forging press in the center.

cally for this operation and were built and installed by Lee Wilson Engineering Co. The furnace proper is stationary and is heated with radiant tubes using butane as fuel. Under the furnace is a car which has three bases and inner alloy steel covers. The heating cycle is as follows: $1\frac{1}{2}$ hr to heat to 1650°F , soaking 30 min, then cooling in the muffle to 600°F in $3\frac{1}{2}$ hr. Each load to be heated consisted of 18 complete blades, as shown in fig. 7.

FIG. 6 - Radiant tube normalizing furnace. Entry end of the burners is shown near bottom of bell; discharge is through the collector ring around the top of the burner.



The operation of the furnace is as follows: A load of 18 blades, standing on end in an alloy steel support, is set on one of the bases and an alloy steel inner cover is placed over the load. The bottom of the cover sets into a water-cooled oil seal. The nitrogen atmosphere is turned on to completely purge the inside of the blades and cover. Each blade has its own nitrogen inlet pipe, which extends approximately 18 in. inside to insure complete purging. All of the atmosphere for purging and protecting during the heating and cooling cycles goes in at this point. The rate of flow during purging is 500 cu ft per hr. When purging is completed, the car is moved over so that the loaded base is under the furnace; it is then lifted up into the furnace, which is held at 1650°F . During the heating time the nitrogen flow is dropped back to 300 cu ft per hr.

While the first load is heating, the second base is being loaded and purged. At the end of the heating and soaking period, the base is lowered back onto the car, which is then moved so that the second base, which has been purged, can be lifted into the furnace. The third base is then being loaded and purged while No. 1 is cooling and No. 2 is heating. When No. 2 is heated it is lowered on the car and moved over so that No. 3 can go into the furnace. Then No. 1 is unloaded and a new charge put in and purged. The cycle is then repeated.

The atmosphere flow is increased again for the cooling time and is kept on during the entire cycle. A circulating alloy steel fan is in each base to assist in obtaining uniform heating and to agitate the atmosphere. A typical heating rate curve of these furnaces is shown in fig. 8 and illustrates how close the temperature of the blade was kept, despite the difference in metal thickness from end to end.

The transfer car, with bases and inner covers, is below the shop floor level, which keeps the heat away from the operators and gives more floor space around the furnace for preparing the charges and operation of the equipment. The

blades come out clean and bright with no cleaning necessary prior to the next and final heating operation. Scale could not be allowed at this stage of manufacture.

The total fuel consumption of the radiant tubes in this furnace is 2,225,000 Btu per hr. With the furnace operating continuously at 1650°F the tube life is approximately nine months, which is considered good. The transfer car is motor-driven, as well as is the load-lifting mechanism. Flow-scopes are provided to indicate the rate of nitrogen flow at all times, as this is the only means which the operator has of being sure that atmosphere is going into the charge.

All of the alloy steel fixtures and inner covers are 35 Ni—15 Cr alloy. The life of this alloy under the repeated heating and cooling cycles is very good. Extreme care was taken in the design of the fixtures to eliminate cracking from repeated heating and cooling.

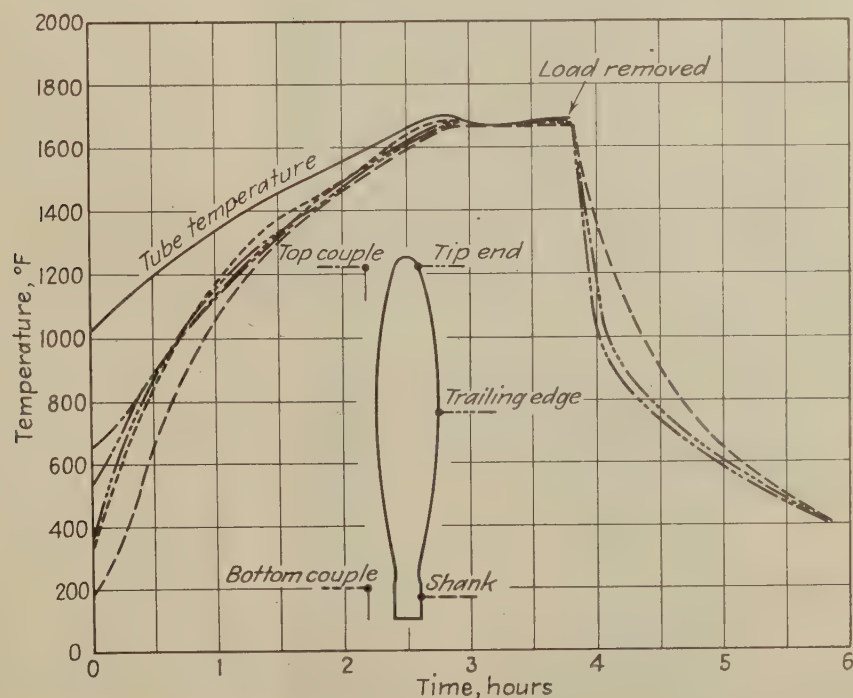
The lining of the furnace consists of 9 in. of 2600°F insulating fire brick backed up with 1 in. of block insulation. Temperature control is fully automatic. The control thermocouple is located inside the cover.

A great deal of thought and planning was given to the most suitable design and arrangement of the quenching furnaces before a final decision was made. No scale or decarburization can be allowed and temperature uniformity must be nearly perfect. Because of these exacting requirements, individual furnaces were decided upon—that is, only one blade to be in the furnace at a time. The furnaces are electric with a full alloy steel muffle, and were built by Hevi Duty Electric Co., Milwaukee. The reason for the use of a muffle in an electric furnace is to keep the area to be purged after each heat to an absolute minimum, so as to shorten the purging time. Some sections of the blades are extremely thin at this stage of manufacture and must be protected before they begin to show color. Employ-



FIG. 7 - Typical arrangement of blades in the fixture prior to positioning inner cover of the normalizing furnace in place. Number of blades in a load depends upon size of the propellers.

FIG. 8 - Typical time-temperature curve for the normalizing furnace. Atmosphere: 0.0 pct CO₂; 0.0 pct O₂; 1.5 pct CO.



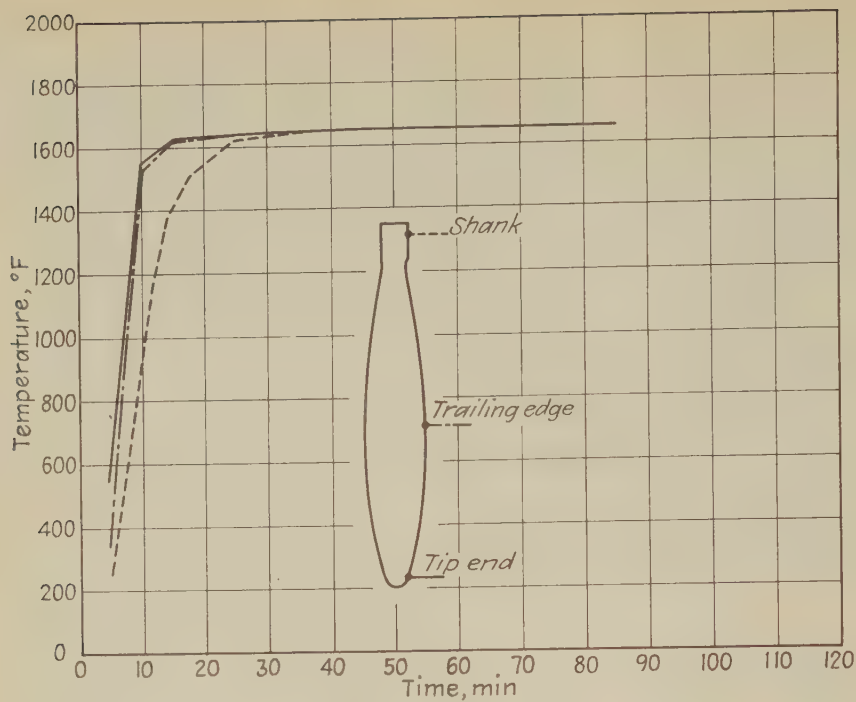
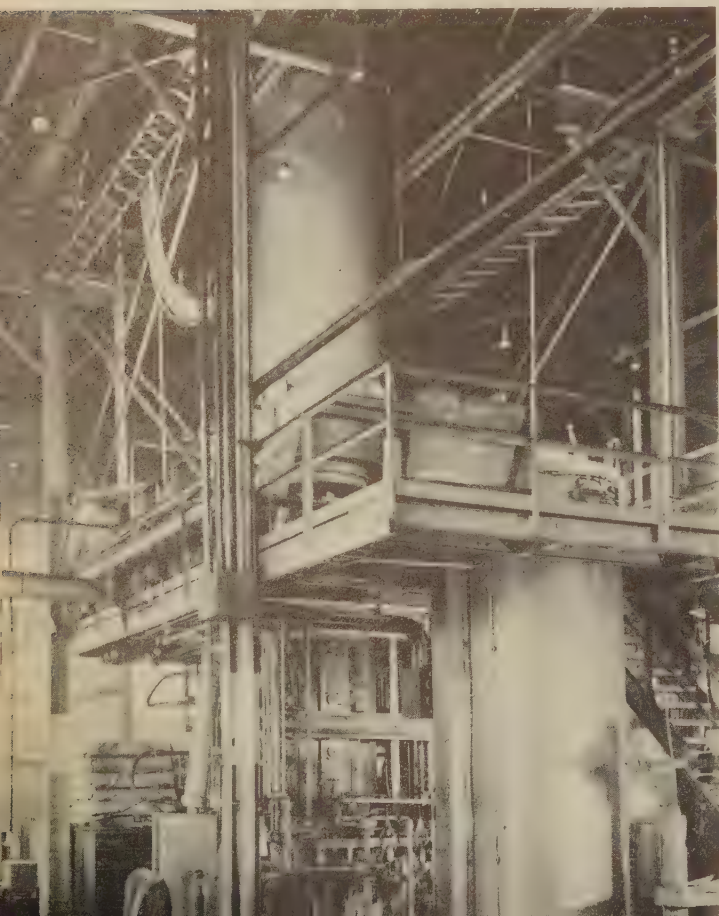


FIG. 9 - Time-temperature curve for the quenching furnace.

FIG. 10 - Quenching furnace at the top level heats propellers, which are placed in the furnace hub end down. At the end of the heating cycle, the propeller drops from the heating furnace into the quench beneath. The combination normalize and draw furnace is at the lower right-hand side of the illustration.



ment of individual furnaces gives more perfect control of temperature and atmosphere than could be obtained with multiple muffles in a single chamber, or with a number of blades in a single open chamber.

The furnace muffle is 20 in. diam by 9 ft 6 in. deep, and is constructed of 3/16 in. thick 35 Ni—15 Cr alloy. It hangs from the top of the furnace with a sand seal between the inside of the muffle and the heating element space. The atmosphere inlet is at the bottom and a baffle is provided so that the gas does not impinge on the work. The furnace is provided with three zones of control, from top to bottom, with a total connected load of 143 kw. The top zone has 28 kw, the middle zone has 70 kw, and the bottom zone has 45 kw. Fig. 9 is a typical time-temperature curve of the furnaces.

The blades hang in the furnaces with the shank, or heaviest end, in an upward position and are supported on an insulated alloy steel cover. The blades are completely purged on the inside with dry nitrogen before going into the furnace; this flow is maintained during the entire heating and quenching period. The protective atmosphere in the muffle is also dry nitrogen and flows at 150 cu ft per hr. while heating. When the cover opens to remove the blade, this flow is increased to 250 cu ft per hr. All furnaces are equipped with flow meters. The furnaces are set seven in a row in a pit with the top at floor level.

The quenching cycle is so timed that the workman can keep going from No. 1 furnace to No. 7, then start over again without loss of time. The time for getting the blade out of the furnace and into the quench is a period of 9 to 11 sec. After each blade is quenched, it is put into a holding furnace, which is held at 600°F until a load of 18 blades is obtained, at which time the load is transferred into a draw furnace.

The draw furnaces which were operated during the war did not have atmosphere control. However, those which have been installed since will be arranged for atmosphere control. This eliminates any possibility of scale or discoloration and is considered a very necessary precaution.

A more recent installation (fig. 10) shows two larger furnaces—a combination normalize and draw furnace and a quench furnace. These units are considerably larger than the ones previously described, but have the same general characteristics. The arrangement of the quenching furnace is different from the others in that it is mounted in an upside-down position on top of the quench. In this arrangement the blade is pushed up into the furnace. Each furnace has a connected load of 230 kw, with four zones of control. The temperatures are controlled and recorded by Leeds & Northrup Co. instruments, and all are mounted on one main panel. These units were built and installed by General Electric Co.

Because of the size and weight of the muffle in the quenching furnace, the problem of supporting it and taking care of the expansion and growth was solved by hanging the muffle from

the top through a counterweight. This counterweight is just heavy enough to support the muffle and hold it against a seal at the bottom without stretching it when hot. This method has proven very effective, and after many hours of operation, the muffle is in excellent condition. These muffles are also made of 35-15 alloy, as are all the other alloy parts.

The atmosphere for these furnaces is supplied by a 1000 cu ft per hr General Electric Co. nitrogen generator. The analysis and dew point are the same as previously discussed. Considerable work has been done on carbon restoration, using these furnaces and the nitrogen generator with excellent results. In present operation a carburizing atmosphere is maintained in the normalizing and quenching type of furnaces.

The forging furnaces described in this article are perhaps the first complete atmosphere-controlled, high-temperature furnaces for forgings designed and built. It is the opinion of the writer that the field for this type of furnace has great possibilities, and that this initial design is an attempt at solving some of the problems of atmosphere control in high-temperature operation.

... NEW BOOKS ...

"Copper as an Alloying Element in Steel and Cast Iron," by C. H. Lorig and R. H. Adams. Reference handbook for the metallurgist, design engineer and others gives technical information on the use of copper as an alloying agent in iron and steel. Data on the properties, characteristics and applications of cast copper steels, wrought copper steels, copper cast iron and copper malleable iron are included. 213 p. \$3.00. McGraw-Hill Book Co., 330 W. 42nd St., New York 18.

* * *

"Engineers' Council of Professional Development Report." Annual reports of the standing and special committees of ECPD, largely dealing with curricula for the engineering colleges, are published in this booklet. 48 p. 50¢. Engineers' Council for Professional Development, 29 W. 39th St., New York 18.

* * *

"Industrial Electronics Reference Book." Book, prepared by electronics and research engineers of Westinghouse Electric Corp., describes the basic theory of electrons and design, application and maintenance of electronic equipment in industry. New instrumentation developments, motor control, dielectric heating, resistance welding, photoelectric devices and other subjects are included. 680 p. \$7.50. John Wiley & Sons, 440 Fourth Ave., New York 16.

* * *

"1948 Modern Plastics Encyclopedia." New edition of this volume describes 122 new plastics

products in a wide variety of fields with an explanation of the application, the material used and other information. Stock molds for over 2000 products are illustrated. Information on how to make molds, molding processes and advantages and limitations of each process are included. 1667 p. \$8.50. Modern Plastics Encyclopedia, 122 E. 42nd St., New York 17.

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"Quality Control," by N. L. Enrick. Manual of procedures for quality control in various types of manufacturing plants gives information on wartime control developments, statistical methods and other techniques. 122 p. \$3.00. Industrial Press, 148 Lafayette St., New York 13.

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"Smoke: The Problem of Coal and the Atmosphere," by Arnold Marsh. The problem of smoke from industrial and household chimneys is discussed in this book and the measures which have been taken and can be taken for smoke abolition are described. 306 p. \$7.00. Sherwood Press, Box 552, Edgewater Branch, Cleveland.

* * *

"Proceedings of the Society for Experimental Stress Analysis, Vol. 5, No. 2," edited by C. Lipson and W. M. Murray. Reports on 16 different types of stress analysis jobs are given in this volume. Photogrid processes, strain gage systems, three dimensional photoelastic analysis by scattered light and other techniques are described. 155 p. \$6.00. Addison-Wesley Press, Inc., Kendall Square, Cambridge 42, Mass.



FIG. 1 - In this setup, four pin bearings of a Packard crankshaft are ground. The operator is about to lower one of the gages, which is arranged so that grinding ceases when the pin diameter is reduced to specified size.

Grinding Packard Crankshafts

CRANKSHAFTS and camshafts for eight cylinder engines are machined on a high production basis at Packard Motor Car Co., Detroit, with extreme precision. Incorporated into this machining line are Norton Twinamatic crankshaft grinders for final grinding of crankpin bearings. These bearings are ground two at a time and four per loading of the machine. In final grinding, 0.030 to 0.035 in. of metal is removed, holding to ± 0.0002 in. of the nominal size of 2.150 in., plus 0.0003 in. which is left for removal in final polishing. Drawings allow ± 0.0005 in. tolerance. In other words, the aim in grinding is to have the size 2.1503 in.

after the final grind so that, after polishing, the diameter will be 2.150 in.

While a single Twinamatic machine could be set up to grind all eight pin bearings, faster and more precise work is done by using two machines, each grinding four pins. Two machines are required in any case to keep pace with the remainder of the crankshaft line. In consequence, the first machine, shown in fig. 1, is set up to locate from the first and fifth main bearings while grinding the first and eighth and then the second and seventh pins. In the second machine, locating from the first, second, fourth and fifth main bearings, the third and sixth pins and then

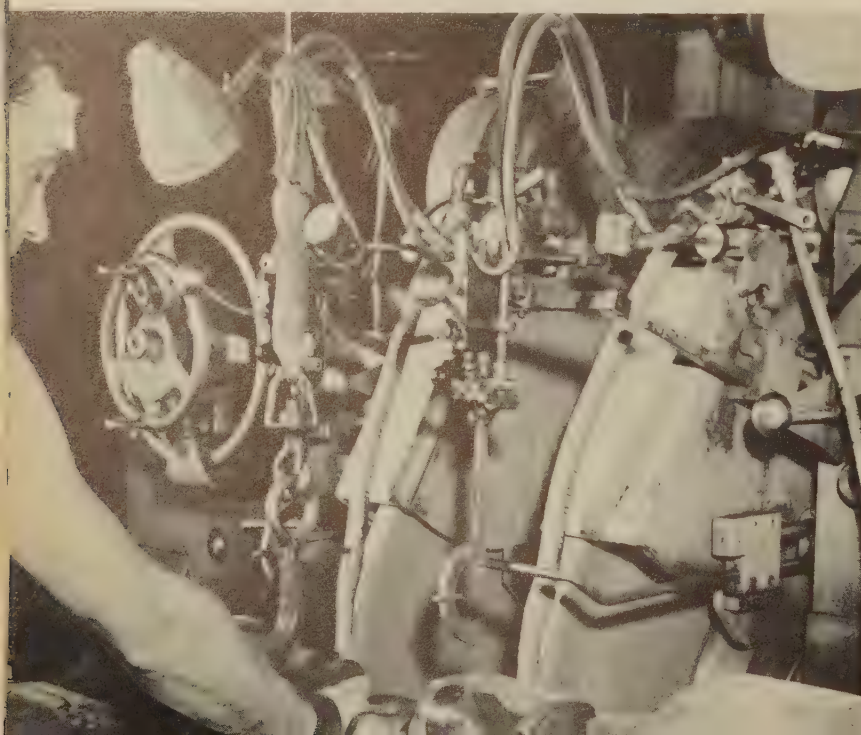
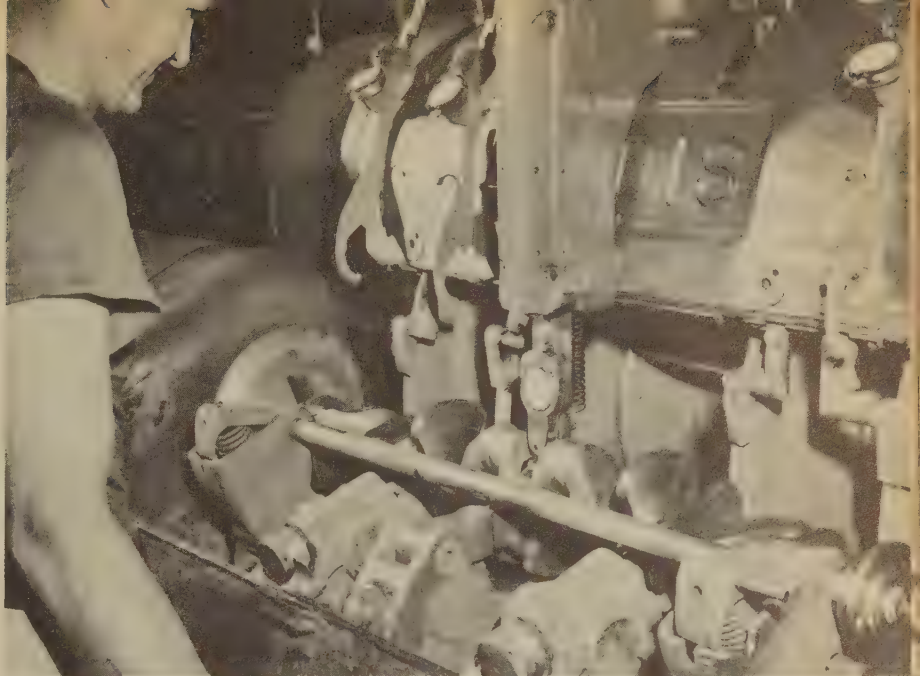


FIG. 2 - A crankshaft is being loaded into the second pin grinding machine. Chucks are counterweighted to compensate for unbalance in rotating about the crankpin centers.

FIG. 3 - This grinder sizes four crankshaft main bearings and an oil throw diameter with four wheels, the widest of which is slotted.



and Camshafts

the fourth and fifth pins are ground.

The setup is such that the chucks that hold the shaft at each end are counterbalanced to compensate for the unbalance of a shaft rotating about crankpin centers always come to rest in the loading and unloading position. This is shown in fig. 2. A Thor safety-balance hoist is employed to lift the shaft into and out of the machine from a chain conveyor.

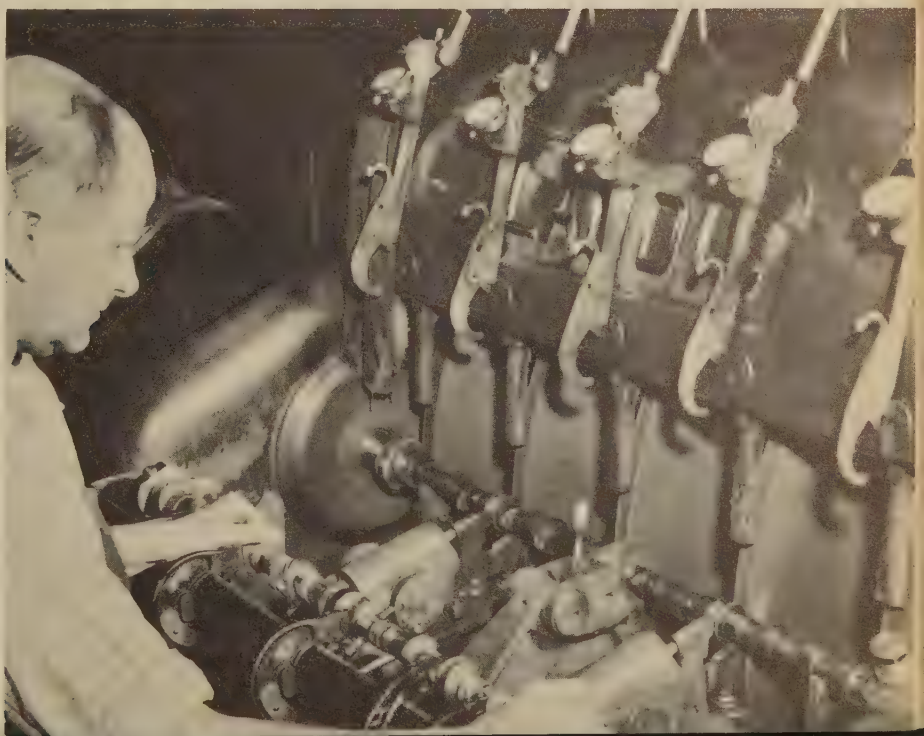
When the shaft to be ground is in place the operator presses a starting button and the shaft is clamped automatically and begins to rotate. At the same time coolant containing one part soluble oil to 25 parts of water starts to flow

By **GEORGE W. DEISLINGER**

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Production with precision is accomplished in the grinding setup in operation at Packard Motor Car Co. for grinding the crankpin bearings and camshaft bearings. An unusual induction hardening installation is used to harden the bearings and the gear of the camshafts. Equipment, production and tolerances are described in this article.

FIG. 4 - In finish grinding the five bearings of the camshaft, dial gages indicate the diameter when lowered to work position, but final check is with snap gages.



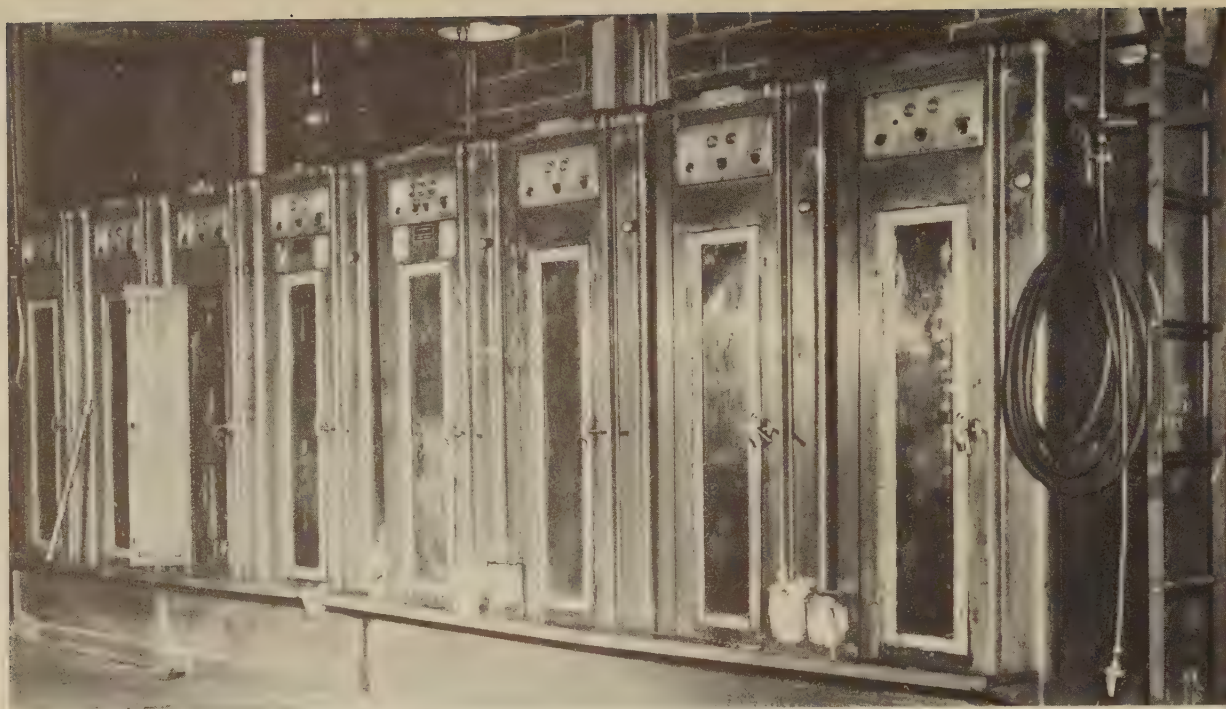


FIG. 5 - In this battery of eight induction hardening cabinets, camshaft cams and the gear is hardened automatically. The cycle starts when shafts are loaded and the glass doors are closed.

and the two grinding wheels feed in rapidly to grinding position and begin to cut.

As size approaches that specified, hydraulically operated steady rests, one opposite each wheel, move in to bear against the two pins being ground while the final few thousandth are being removed. At this time, the operator lowers a pair of Foster gages so that each contacts one of the two pins being ground. When the dial gages show zero reading, the feed of the wheels stops automatically and the wheels rapidly back off. Steady rests also back off. Indexing to the position for the second pair of pins takes place rapidly and, when completed, the wheels and steady rests repeat their infeed, size the pins and again back off.

This completes the grind for that machine and it stops for unloading and reloading. Then the crankshaft is ready for transfer to the second duplicate machine. The whole cycle is controlled electronically and is automatic except for pressing the starting button and for lowering and raising the gages that control the final size of pins.

When wheels require redressing, the operator, at the end of a grinding cycle, merely presses the button for redressing and the machine runs through an automatic dressing cycle and returns the dressed wheels to position for starting the next grind. While this proceeds, the operator loads another crankshaft. Each machine has its own 20SV Norton 8 x 1 $\frac{1}{4}$ in. wheel for redressing purposes. Grinding wheels are 42 in. diam when new, 1.343 in. thick and turn at 590 rpm. Both Norton and Sterlith vitrified wheels are employed.

Each of the Norton Twinamatic machines grinds the four pin bearings on 15 crankshafts in 1 hr,

or more than twice as many as were done previously on single-wheel machines. In other words, a single machine with one operator exceeds the rate of two older machines and two operators, besides holding closer limits consistently.

Before crankpins are ground, the four main bearings and an oil throw diameter are ground on a Landis machine. This machine employs three narrow and one wide wheel, the latter being slotted to finish two adjacent diameters. These wheels remove 0.035 to 0.040 in. of metal. All wheels are Norton A54 Q5VA grade and are 42 in. diam wheels. Two are 1 $\frac{5}{16}$ in. wide, one is 1 $\frac{1}{8}$ in. wide, and the total width of the slotted wheel is 3 $\frac{1}{8}$ in.

When grinding the main bearings, as shown in fig. 3, the crankshaft is rotated on centers and is located from end to end by an indicator at the center bearing. Wheels feed in automatically but sizing is controlled by the operator who stops the feed when size, as indicated by Foster gages, comes within the limits specified, all five diameters being the same.

Wheels are redressed automatically when the dressing control button is pressed. A single set of wheels has sized in excess of 25,000 shafts. On this machine, 22 crankshafts per hr are ground by a single operator. This is faster than for a previously used machine that employed a single wheel to size all five chambers.

For both rough and finish grinding of camshafts, which are cast from arrested malleable steel, Landis grinders, equipped with five wheels on a single spindle, are employed, the finish grinding operation being shown in fig. 4. Shafts are finish ground within ± 0.0005 -in. limits on all five bearings at a rate of 48 an hr, the shaft turning on centers. Formerly a single-wheel ma-



FIG. 6 - Each cabinet holds two camshafts, and heating rings progress from the bottom to the top. All heated surfaces are quenched individually as soon as they reach the required temperature.

chine was used first to size the center bearing and then, in succession, the pairs of bearings at each side of center.

As the camshaft is long and slender, a fixed steady-rest is employed on a center diameter previously ground and hydraulic rests are applied about midway between the center and each end opposite two of the grinding wheels. All wheels are 48 in. diam and are fed in hydraulically.

A set of five dial gages is used to check diameters as grinding proceeds and as a means of judging when to stop the feed. Final check of bearing size is by go and no go snap gages. All wheels are slightly wider than the bearings they grind and are dressed about once an hour. More than 40,000 camshafts have been ground with a single set of wheels and they are still good for many thousands more grinds. Rough grinding is done on a duplicate machine. It removes about 0.015 in. of metal as against 0.010 to 0.012 in. in finish grinding.

After rough grinding the bearings and all seventeen cams—the latter in a conventional cam grinding machine—and cutting teeth of an integrally cast gear, all cams and the gear are hardened in a Tocco machine having eight separate stations. Each station is enclosed in a glass door cabinet and each holds two camshafts vertically, clamped at a bearing near each end and in the center. This battery of hardening units is shown in fig. 5.

In each cabinet, there is a pair of heating rings or coils. One has its center in the axis of each shaft and together they form a single unit that is fed from the bottom up as heating proceeds. This arrangement is shown in fig. 6. Motion and dwells are automatically timed so that the coils come to rest and dwell for a given

time at each of the 18 cams and the gears to be hardened.

After a given interval, each cam and gear in succession is raised to a red heat by the induced current and, immediately after reaching this heat, is quenched by a spray of water from all sides. Timing of the sprays is precise and as soon as quenching is completed the coils are shifted to the next higher level where the process is repeated until all areas that need hardening are hardened.

Just below the heating coil is a perforated ring that feeds a continuous spray of water to cool the area sprayed through absorption of air heat conducted from the higher level. This cooling also prevents the area previously hardened from receiving enough conducted heat to anneal it.

All controls are automatic and are electronic so that the operator need only load and unload the shafts. Cabinets are filled and cycled in rotation, but are so arranged that when the doors are opened power is shut off as a safety precaution. Not until the door is closed will the new cycle begin or continue.

By loading the cabinets in rotation, 42 to 45 camshafts an hr can be treated. As heating is done in successive stages from end to end and the camshafts are well supported, there is little tendency for distortion. If the amount is significant, the shaft, which remains soft except in the areas that are purposely hardened, is straightened before the final grinding of the hardened areas is done.

The generators and high-voltage elements of the Tocco setup are in a vault behind the cabinets, away from the working area. Each cabinet has its own start and stop button by which normal operation can be interrupted and started again if occasion demands.

Electroplating Developments . . .

Practical developments in electroplating highlighted the papers presented at the 35th annual convention of the American Electroplaters' Society, held at Atlantic City this summer. Abstracts of papers read at the technical sessions dealing with diaphragm tanks for copper plating, bright barrel plating of nickel and zinc, a circulating electrolyte cell for strip steel plating evaluation, deposition of metals on plastics and electroplaters' metals of the future, are given in this article.

A PRACTICAL method for avoiding roughness in plating copper to thicknesses in excess of 0.0005 in. was described in a paper presented at the annual meeting of the American Electroplaters' Society by R. H. McCahan, C. E. MacKinnon and D. A. Swalheim, E. I. duPont de Nemours & Co., Niagara Falls, N. Y. In this method, the copper plating tank is separated into anode and cathode compartments by a heavy canvas diaphragm and the electrolyte is continuously pumped from anode to cathode compartment through a high efficiency filter. The system gives very smooth work at high plating speeds and is said to eliminate excessive buffing costs.

The two key facts proved in developing the techniques were: (1) That substantially all particles causing the common type of roughness are generated by an electrochemical process at anodic surfaces, and (2) these particles are 100 pct filterable by a properly selected filter medium.

Diaphragm partitions, consisting of two layers

of .11-oz canvas duck (relatively tight from the standpoint of solution permeability) were mounted in a suitable frame fastened to the tank walls, and served to separate the two anode compartments from the cathode or plating compartment. The anolyte is withdrawn from the anode compartments, pumped through a filter and discharged into the cathode compartment. This creates a hydrostatic head on the cathode side of the diaphragm, and the pressure thus formed forces the electrolyte through the diaphragm into the anode compartment so that there is no tendency for particles to migrate into the plating compartment.

It has been found that the same factors which cause roughness in the plating tank are also frequently present in the copper strike. In such cases it is recommended that a diaphragm be installed in the strike as well as in the main plating tank.

This paper was awarded the AES Founders' Gold Medal, given for an outstanding paper read at an annual convention.

Circulating Cell for Strip Steel Plating Evaluation

A CIRCULATING electrolyte cell and auxiliary apparatus for determining the effect of variations in electrolyte composition and temperature on the properties of tin deposits on steel strip were described in a paper by R. A. Dimon, Carnegie-Illinois Steel Corp., Pittsburgh. The cell was developed to permit laboratory duplication of commercial electroplating conditions.

Still plating tests had proved of little value due to the extremely low current densities permissible in such units, but the circulating cell provided data on current density limitations which could be translated directly into full scale operation control.

A Parallel Electrode Cell was used for most of the electrolyte studies. The cell itself is a square, hard rubber tube. The cross-section of the

orifice is $\frac{3}{4} \times \frac{3}{4}$ in. when both anode and cathode are in place. The cathode strips are cut 9.6x1 in. Since the edges fit into slot, the actual effective area is 9.6x $\frac{3}{4}$ in. which is 0.05 sq ft. Thus if a current of 5 amps is used, the resulting cathode current density is 100 amps per sq ft. The anodes are of the same dimensions as the cathodes, except for greater thickness to allow for a large number of tests between anode changes. Two phosphor bronze springs hold each electrode against the inner surface of the slots and introduce the current by means of binding posts on the outside.

Data presented in this paper were results obtained upon an electrolyte studied at the following compositions: Stannous sulfate, 30.0, 60.0 and 90.0 g per l; sulfuric acid (95 pct), 28.0 cc

Discussed at AES Annual Meeting

New Officers of AES

At the business meetings of the AES Convention, C. F. Nixon, Director of Process Engineering, Fisher Body-Ternstedt Div., General Motors Corp., Detroit, was elected third vice-president of the Society. Advancement of the other officers was confirmed, with S. S. Johnston, Technical Director of the Electrolytic Dept., Weirton Steel Co., Weirton, taking over the duties of president. A. W. Logozzo, Nutmeg Chrome Corp., Hartford, Conn., is now first vice-president, and W. J. Neill, Columbus Metal Products Co., Columbus, Ohio, is second vice-president.



C. F. Nixon

per 1; O-cresol, 10.0 cc per 1; glue, 1.0, 5.0 and 10.0 g per 1; and B-naphthol, 1.0 g per 1.

A resistance melting apparatus was used for melting and quenching the tin coated strip produced in the circulation cell, and a reflectometer was used for measuring the luster of the coating to determine the effectiveness of the plating conditions employed.

While the apparatus described is a useful laboratory tool in the study of electrolytes, it does not determine such factors as ease of bath control or the performance of addition agents in actual commercial operation. It does, however, furnish adequate data as to the optimum current density range of an electrolyte under conditions comparable to full scale continuous plating.

From the data obtained upon the electrolyte

described above, the following conclusions were drawn regarding current density range:

- (1) An increase in the rate of solution flow (strip speed) raises the current density at which the best deposit is secured.
- (2) Raising the electrolyte temperature also has the effect of increasing the optimum current density.
- (3) An increase in the tin content of the electrolyte also favors the employment of a higher current density.
- (4) In the range of glue concentrations studied, an increase in glue content lowered the optimum current density.

Bright Barrel Plating of Nickel and Zinc

A PAPER discussing practical requirements for obtaining bright, uniform nickel and zinc deposits using barrel plating techniques was given by L. A. Chesworth, United-Carr Fastener Corp., Cambridge, Mass.

In the nickel work, specifications call for deposits up to 0.00075 in. and an appearance approximately equal to that obtained in still tank bright nickel baths. Nickel plated parts must take a subsequent chromium plate, and often with an interval of as long as two weeks between the operations.

Most of the work reported was done in a solution having the following composition: Nickel sulfate, 40 oz per gal; nickel chloride, 10 oz per

gal; magnesium sulfate, 24 oz per gal; boric acid, 5 oz per gal; brightener (combination metallic and organic), 4 to 5 fl oz per 100 gal. The bath operated at a pH of 4.7 to 5.0 and at a temperature from 75° to 130°F, with 120°F found to be the optimum. This bath was found simple enough and stable enough to operate properly, with reasonable control, on a three shift per day production schedule.

Contamination of the plating bath by metal impurities, especially copper, zinc and iron, proved to be an important obstacle to maintaining good barrel bright nickel deposits. The metals dissolve in the plating solution and soon accumulate to give concentrations of the impuri-

ties which result in dark recesses. Poor throwing power, dullness, spotty brightness and flaking were attributed to improper brightener concentration or balance due to metal impurities.

Heating the bath from 80°F to 110°F gives an increase of 30 pct in the current with no change in voltage. By increasing the temperature to 125°F, an increase of almost 50 pct over the current at 80°F should result.

Current density proved to be another important factor in obtaining consistently good deposits. Barrel loads of the different parts have widely varying and surprisingly large surface areas, from perhaps 75 to 270 sq ft per cylinder load. It was believed, at first, that every type of product could be plated at 12 v in this bright bath. It was soon discovered, however, that there is a critical current density not to be exceeded on any part of the piece being plated. This critical current density is determined not only by the square feet of surface in the barrel but also is a function of the shape of the part. In the bath described, at 80°F, for the normal run of work, an apparent current density of 1 amp per sq ft was found to be a safe figure. This value may be increased slightly for uniform free tumbling parts, but to prevent burning, must be decreased for irregular parts having

projections which receive an abnormally high share of the current.

Brightener concentration is the third important factor to control carefully for maximum ductility and uniform brightness, and is normally held considerably lower for good bright barrel deposits than for still tank plating.

A bright barrel zinc unit which has now been in operation for more than 2 years was described. It consists of fourteen 30-in. plating cylinders, each connected to a rectifier which delivers up to 720 amps at 12 v. The actual current drawn is from 450 to 700 amps per cylinder depending on the work being plated. No current regulation is necessary on the zinc as long as the temperature is held below 100°F.

The zinc plating bath has the following composition: Zinc, 4.5 oz per gal; total NaCN, 12.5 oz per gal; NaOH, 10.4 oz per gal; ratio total cyanide to zinc, 2.8 to 1; ratio NaOH to zinc, 2.3 to 1; metallic brightener, 0.15 to 0.30 oz per gal; organic brightener, 0.20 to 0.40 oz per gal; and temperature, 85°F.

Any significant variation in the ratio of the metal, cyanide and alkali contents is reported to seriously affect the cathode efficiency and also may impair the quality and appearance of the deposit. Analytical control is essential at least weekly.

Electroplaters' Metals of the Future

FUTURE possibilities for the 57 metals in which the electroplater has, at present, no interest as coating materials were considered in a paper by F. A. Lowenheim, Metal & Thermit Corp., Rahway, N. J.

In examining the lines along which the electroplating art may expect to expand and improve, one possibility is the introduction of entirely new plating metals.

The fact that gold and rhodium are currently used indicates that high price is not prohibitive, but that usage will be limited to special applications.

There are indications that aluminum and magnesium can be plated from aqueous solutions and if so, for aluminum especially, there would be many uses.

Only a small amount of work has been done on the deposition of the group consisting of scandium, yttrium, the rare earths and actinium. Principal interest has been the use of electrolysis to facilitate rare earth separations.

Of the next group—titanium, zirconium, hafnium and thorium—the most work has been done with titanium, and with ambiguous results in which the phenomenon of depolarization was encountered. Zirconium has reportedly been plated under very carefully controlled conditions, but deposits were so thin that identification was uncertain.

From the group of vanadium, columbium, tantalum and protoactinium, there have been reports of the deposition of vanadium and tantalum, but the latest literature appears to refute the experiments. Tantalum, columbium and zirconium

all possess properties which would render their successful electrodeposition of considerable importance.

Molybdenum apparently is one of the selfpolarizing metals, and in spite of many claims and patents for the deposition of the metal, no methods have been substantiated by workers attempting to check them. The Black Molybdenum process has received some commercial acceptance, but the deposit is a mixture of nickel and molybdenum oxides and not molybdenum metal.

Of all the uncommon metals, tungsten has probably received the most attention. And while there is no doubt that alloys of tungsten have been plated, it remains questionable whether pure tungsten has been deposited from water solutions.

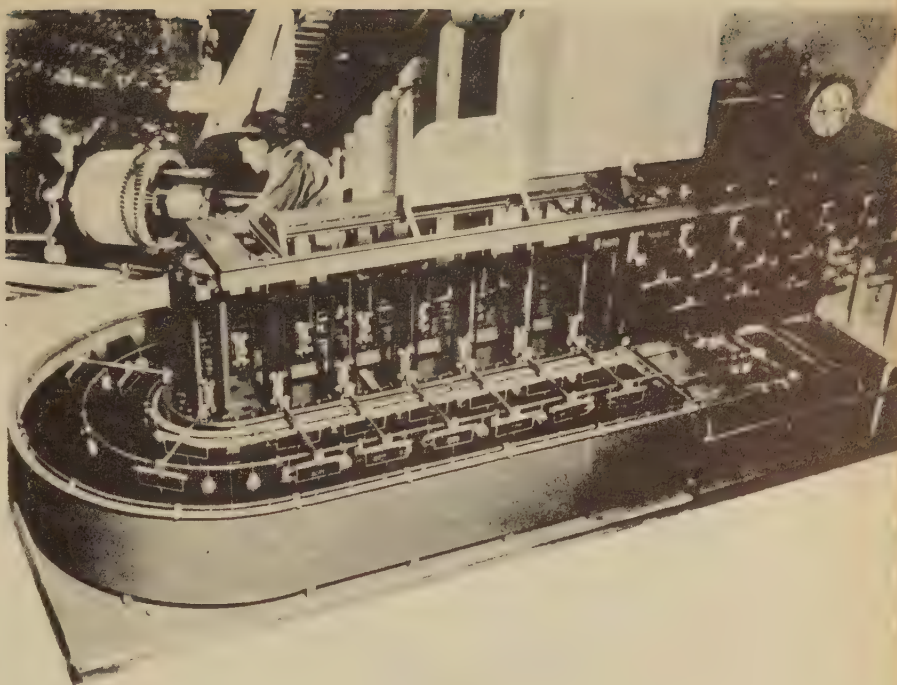
There is little on uranium deposition in the literature, and if Atomic Energy Commission researchers have developed processes, these have not yet been published.

The author's guess is that tungsten, and possibly molybdenum, deposition may not be too far in the future. There is much interest in tungsten plating, and sooner or later someone will uncover the secret as Fink found the trick to chromium plating.

Manganese, rhenium, gallium, germanium, selenium, tellurium, and polonium can apparently be plated readily enough, but uses for such deposits have not yet been established.

Selenium can be easily deposited from a solution of selenious acid and a recent patent infers that it may be useful in rectifiers and such electronic applications. Tellurium is also easily

A feature of the equipment exhibit held in conjunction with the annual meeting of the American Electroplaters' Society was a working model of an elevator type full automatic conveyor which was in operation plating copper, nickel and gold on small souvenirs.



plated, but the extreme brittleness of the deposit bars its use.

Polonium, a very rare radioactive element, can be deposited by immersion on many metals. A commercial use for such deposits is said to be on spark plug electrodes for improved performance.

Arsenic, bismuth and antimony all have been deposited. Antimony in particular is interesting in that plating is simple, the material is rela-

tively cheap, it has good corrosion and tarnish resistance, and when polished has a pleasing appearance. Recently, Bloom patented an electrolyte for antimony, and his process, avoiding brittleness and nonadherence of the film by special preparation of the base metal, may develop considerable plating interest.

The author concludes that although new metals come into use, metals already being plated are not discarded. The field simply expands.

Deposition of Metals on Plastics Employing Reduced Copper Films

PRIOR to the development of the copper reduction process described in a paper by Harold Narcus, Electrochemical Industries, Inc., Leominster, Mass., the main objections to the utilization of the available formulations for copper film formation when applied to plastics have been extremely slow copper film formation, non-uniformity and poor adhesion of the copper film, relatively high and objectionable temperatures required to accelerate film formation, and disagreeable reaction products such as sludge, tarry products and pungent gasses.

The copper reduction process described by Narcus is said to eliminate the foregoing objections. The process basically involves the following cycle:

- (1) Roughening the plastic surface by wet tumbling the parts in pumice and water or by blasting with alumina.
- (2) Cleaning the surface with the mild proprietary cleaners commonly used for soak cleaning of nonferrous metals.
- (3) Sensitizing the surface by immersing the plastic part, after completely rinsing away any residual cleaner on its surface, for 1 to 2 min in

a solution of 50 cc conc. titanous chloride, 50 cc HCl, and 1000 cc water.

The plastic part, after treatment in the above solution, is thoroughly rinsed for 5 min in running water.

(4) Activating or seeding the surface by immersion in an extremely dilute solution of chloroplatinic acid. A concentration of 1 g of the acid per gal of distilled water suffices. The part is treated for 5 to 10 min depending on the intricacy of the part.

(5) Formation of the reduced copper film by reduction of Fehling's solution employing a 20 pct by weight solution of a metallic sulfoxalate formaldehyde.

The copper film formation does not occur until after a period of 4 to 5 min. Then the film formation is rapid, accompanied by visible gassing and darkening of the solution. The copper "bonding" is complete after 30 to 45 min.

(6) Electrodeposition of the intermediate layer of metal. After formation of the copper film, the part is thoroughly rinsed in water and dried and is then copper or silver plated. Standard techniques for subsequent plating and polishing of the piece are used.

Metallurgical Aspects of Ball Bearing Steels

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Accelerated life testing is the principal method of evaluating the material aspects of ball bearings. Continuing a report of an extensive investigation into the metallurgical requirements of bearing steels, the author presents, in this concluding part of a three-part article, bearing life curves for eight bearing steels, as compared with established E-52100 steel values. Also discussed are the commercial and metallurgical advantages arising from the substitution of molybdenum for chromium in bearing steel compositions. A listing of 27 significant references is also included.

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UPSET forgings of rings from hot-rolled bars are commonly employed for the fabrication of rings over 5 in. in diam, while cold-drawn, hot-rolled and turned seamless tubes machined on automatic screw machines have been gradually replacing the forged method for producing rings in sizes under 5 in. in diam. Race rings less than 2 in. in diam are usually produced on automatic screw machines from turned or cold-drawn bars.

The steels listed in table VI were fabricated as follows: the manganese-molybdenum and the 0.5 pct Mo steels were obtained in 2 in. round annealed bars and inner race rings were produced by machining in automatic screw machines. The WPB steels were obtained in the form of turned seamless steel tubes in the annealed condition and were machined in automatic screw machines. Also received was a 2¼-in. round bar from each analysis for metallurgical testing.

The heat treatment of E-52100 rings is fairly well standardized with respect to the hardening and tempering temperatures. A hardening temperature range of from 1500° to 1550°F is commonly employed; the temperature being adjusted within this range, by fractured grain size tests, to suit the characteristics of the particular melt. The time cycle is also adjusted by fractured grain size tests. Quenching is conducted in oil at 120° to 140°F. The tempering operation is

TABLE XII

Heat Treatment, Hardness and Fractured Grain Size of Rings Made from Steels Listed in Tables II and VI

Steel Designation	Austenitizing Temp., °F	Quenching Medium	Tempering Temp., °F	Hardness Range, Rc	Fractured Grain Size Range
"A" Mn-Cr	1500	oil	325	63-65	7.5 - 8.0
"B" Cr-Mo	1525	oil	325	63-65	8.5 - 9.0
"C" Cr	1525	oil	325	62-65	8.0 - 9.0
"K" Mo	1500	oil	325	63-65	8.0 - 9.0
0.5 pct Mo	1540	oil	325	64-65	8.0 - 8.5
Mn-Mo	1500	oil	325	61-63	8.0 - 8.5

performed at 300° to 350°F, depending upon the

In the first two parts of this article, *THE IRON AGE* and , the author presented extensive hardenability data and indicated, quantitatively, the relations between various factors, including chemical analysis, grain size, hardenability, austenitizing temperature, nonmetallic inclusions, carbide segregations and impact strength.—Ed.

hardness desired. The hardness of rings usually desired is 61 to 62 Rc, however, in certain instances the range may be widened to 60 to 64, or adjusted to a 63 to 65 range.

The heat treatment for the rings made from the special steels under investigation is shown in table XII, associated with the hardness and fractured grain size.

The ball bearing industry relies mainly on accelerated life tests to evaluate the material aspects of the ball bearing. Upham²⁴ states that testing laboratories use this approach (fatigue tests of finished ball bearings) widely in studying suitability of materials for a given part, especially in the automotive, aviation and allied industries. Figs. 30 through 37 give bearing life curves for bearings including the steels listed in table VI and for bearings containing inner rings made from openhearth 52100 and a lead-treated E-52100 steel with a high inclusion content. They are compared with the established normal curves of bearings containing rings from E-52100 steel.

In order to obtain these curves the bearings are arranged in order of their fatigue life. The number of bearings of each grade tested is then expressed in terms of percent of life as compared

TABLE XIII

Comparison of Accelerated Life of Bearings Based on Percent Which Failed at Less Than 100 Hr.

Item	Percent
Normal Curve E-52100 inner and outer rings.....	32
Steel "A" inner and outer rings	12
Steel "B" inner and outer rings.....	25
Steel "C" inner and outer rings	39
Steel "K" inner and outer rings	12
0.5 pct molybdenum inner rings	8
Manganese-Molybdenum (Mn-Mo) inner rings	12
O.H. 52100 inner rings	75
Lead treated—high inclusion content—inner rings.....	100

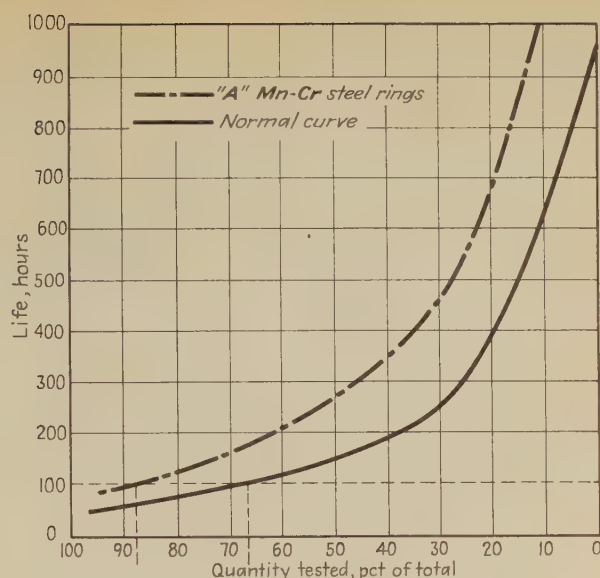


FIG. 30 - Accelerated life test curves for ball bearings assembled with steel "A" - outer and inner race rings, as compared with E-52100 steel (normal curve).

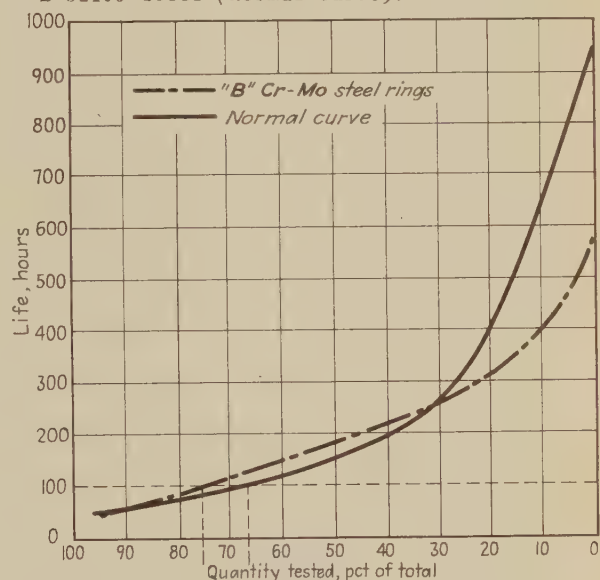


FIG. 31 - Accelerated life test curves for ball bearings assembled with steel "B" - outer and inner race rings as compared with E-52100 steel (normal curve).

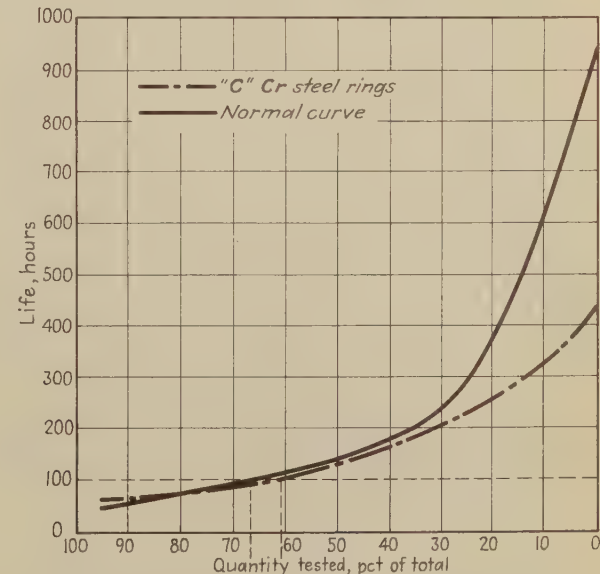


FIG. 32 - Accelerated life test curves for ball bearings assembled with steel "C" - outer and inner race rings, as compared with E-52100 steel (normal curve).

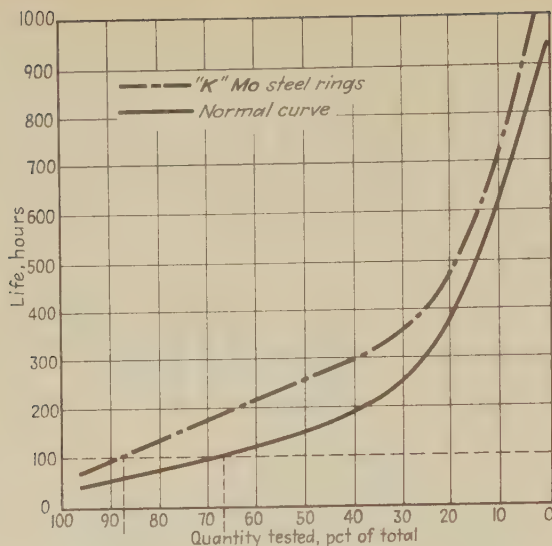


FIG. 33 - Accelerated life test curves for ball bearings assembled with steel "K" - outer and inner race rings, as compared with E-52100 steel (normal curve).

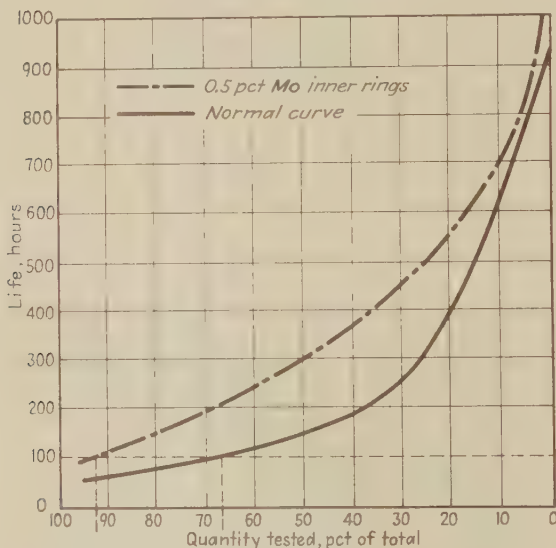


FIG. 34 - Accelerated life test curves for ball bearings assembled with 0.5 pct molybdenum steel - inner race rings, as compared with E-52100 steel (normal curve).

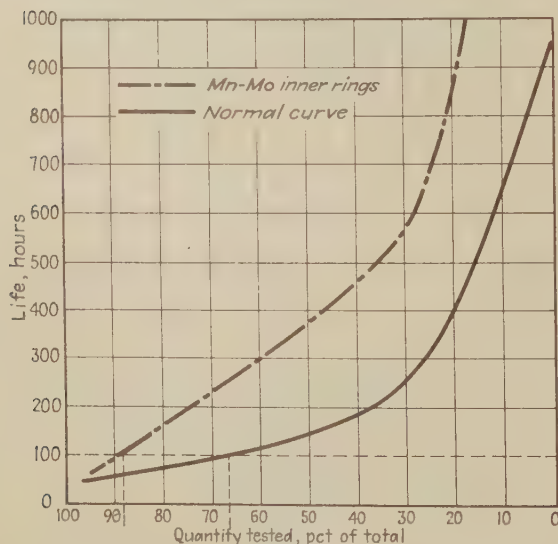


FIG. 35 - Accelerated life test curves for ball bearings assembled with manganese-molybdenum (Mn-Mo) inner race rings, as compared with E-52100 steel (normal curve).

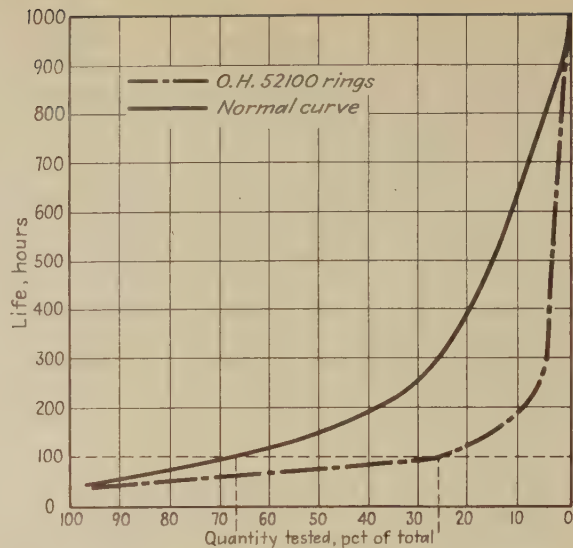


FIG. 36 - Accelerated life test curves for ball bearings assembled with O.H. 52100 inner race rings, as compared with E-52100 steel (normal curve).

with the standard E-52100 grade. An evaluation can be made by visual examination of the curves, the higher the curve the more desirable is the series of bearings. Perhaps, however, the real object of improvement of bearings is to extend the life of the components that fail quickly. It is desirable to set up a minimum life value, say 100 hr, and then proceed to improve the quality so that a minimum life guarantee can be set up.

A comparison on this basis is shown in table XIII. It is interesting to note that in all cases where molybdenum is an intentionally added element the bearing life is improved. For example, using the percent failure below 100 hr as a criteria, steel B shows a 7 pct improvement, steel K 20 pct, 0.5 pct Mo steel 24 pct and manganese-molybdenum steel 20 pct. In bearings containing inner rings made from openhearth 52100 steel, the percentage of failures below 100 hr was increased to 43 pct. In the case where lead-treated high inclusion count inner rings were included in the bearing structure all the bearings tested failed below 100 hr.

There are two main reasons for the development of steel to replace E-52100. One is that an emergency might arise which would place chromium on the scarce alloy list. The scarcity could be brought about by (1) the unavailability of supply areas outside of the United States, (2) difficulties in the seaborne carriage of the alloy from abroad, or (3) an unprecedented demand for chromium in corrosion and heat-resisting steels. The other is the possibility of originating a steel analysis which would lengthen the life of the ball bearing. Oertel⁴ touches on the improvement of ball bearing steels by a modification of the chemical composition of 52100 steel. He mentions the addition of molybdenum and vanadium as well as uranium and boron; and shows the improvement of wear brought about by the addition of molybdenum to the 52100 analysis.

The substitution of molybdenum for chromium is a possibility which appears to satisfy both requirements, that of availability and bearing life improvement. Molybdenum is available in

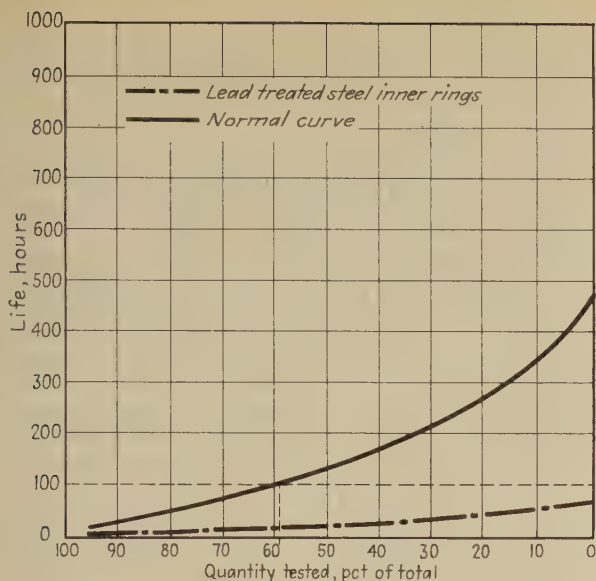


FIG. 37 - Accelerated life test curves for ball bearings assembled with lead treated E-52100 inner race rings, as compared with E-52100 steel (normal curves).

large quantity within the boundaries of the United States, while the life of bearings, judging from the preliminary tests, appears to be improved by the addition of molybdenum or by the sole use of molybdenum as an alloying element.

Jones,²⁴ writing on metallographic observations of ball bearing fatigue phenomena, indicates that during bearing life, because of heat generated by alternating stress conditions, there is a breakdown of the martensitic structure to a transition product. This product has a lower fatigue value than does martensite and therefore causes early fatigue failure. The implications of this interesting paper are that there are possibilities in the utilization of alloys other than chromium to stabilize the martensite. Molybdenum suggests itself as an alloy that could stabilize the martensite. Gregg,²⁵ who in turn quotes Gillet and Mack,²⁶ throws some light on the value of the use of molybdenum. "The fact that molybdenum, like tungsten, can confer the property of red hardness on steel—indicates that this element makes the steel more resistant to tempering."

"Molybdenum steels require decidedly high tempering temperatures to be softened to the same degree as other comparable alloy steels and that resistance to tempering makes them attractive for use where strength at higher temperature is desired," is a statement attributed to Gillet and Mack.²⁶

From a comparison of endurance limits of molybdenum steels with those of other alloy steels, Gillet and Mack concluded that in practically all steels investigated, the endurance limit is directly proportional to the tensile strength and is independent of composition. They pointed out that molybdenum may be of advantage in securing high endurance values, since it may enable the steel to stand a high and prolonged tempering temperature without much softening. In further discussion of the endurance properties of molybdenum steels, Gillet and Mack stated that for the grades of steel used most frequently by the engineer, it appears that claims made for their superior endurance properties are un-

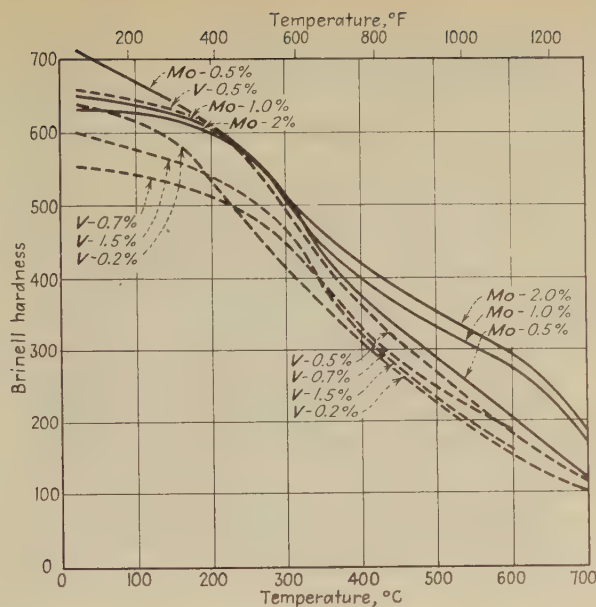


FIG. 38 - Hardness temperature curves by Robin. Molybdenum and Vanadium steels quenched from 850°F (1560°F). Carbon - 0.80 pct.

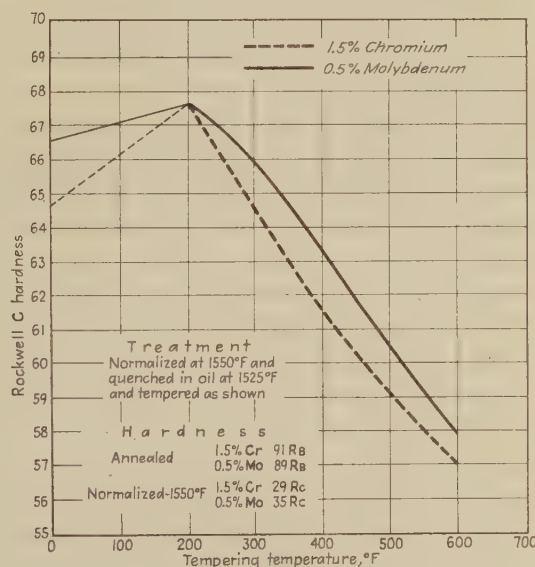


FIG. 39 - The effect of tempering on the Rc hardness of 0.5 pct Mo and 1.5 pct Cr steels.

warranted, if their endurance properties are compared with other steels on the basis of strength and hardness. However, for the same heat treatment, molybdenum steels are frequently superior in endurance because of the higher tempering temperatures required to produce equivalent softening. Robin²⁷ concluded that for temperatures below 110°F, molybdenum is the most effective element for decreasing the drop in hardness resulting from increasing temperature, the addition agents next in potency being tungsten and vanadium.

Hardness temperature curves by Robin on some steels quenched from 1560°F are shown in fig. 38. The compositions as described by Gillet were:

C	Mo, Pct (actual)	Mo, Pct (nominal)
0.73	0.50	0.5
0.81	1.21	1.0
0.81	1.98	2.0

After perusal of this literature it was decided

to study the effect of tempering on the hardness of the 0.5 pct Mo steel referred to in this article and that of a 52100 chromium steel. For this purpose disks 2 in. in diam and $\frac{3}{8}$ in. thick were obtained from a bar of 0.5 pct Mo steel and from a bar of E-52100 steel. The annealed hardness of these disks was 98 RB for the molybdenum steel and 91 RB for the chromium steel. These disks were normalized for 1 hr at 1550°F; their hardnesses after this treatment were 29 RC for the chromium steel and 35 RC for the molybdenum steel. After normalizing, the disks were hardened from 1525°F and tempered at 50°F intervals from 200° to 600°F.

The data are summarized in fig. 39. It will be noted that with a 325°F tempering temperature, which is a standard tempering temperature for ball bearing race rings, the molybdenum steel is about 1.5 points RC harder than the chromium steel.

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German Carbide Tool Developments

TECHNIQUES and equipment used in producing and testing carbide tool metals in Germany during the war years are described in a series of Office of Technical Services reports based on investigations by American and British specialists.

Copies of the reports, which are briefly abstracted below, can be ordered, giving the "PB" identification numbers, from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

Cast Tungsten Carbide—British report discusses the uses to which cast carbides were put and gives the production and equipment details of the Rochling Buderus plant at Berlin. Schematic drawings of furnaces and equipment are included, and power consumption, water requirements and the general plant layout are given. A method for producing an oxide free titanium carbide is also described. PB-78259; microfilm, \$2.00; photostat, \$5.00; 73 p.

Tungsten Carbide Production—Practices at the Krupp Widia plants for production of various grades of tungsten carbide are described. Processing of raw materials and the shaping of tool forms are discussed, and photographs and diagrams of a variety of furnaces are included. PB-49243; microfilm, \$1.00; photostat, \$1.00; 42 p.

Metallographic Preparation—Technique for preparing tungsten carbide specimens using ap-

propriate grades of diamond dust rather than silicon and boron carbide is described. Diamond lapping method is also discussed. PB-52703; microfilm, \$1.00; photostat, \$1.00; 9 p.

Carbide Industry Report—Report covers the history of carbide production at Krupp Widia and gives details of production methods, including brazing, grinding, hot pressing, sintering, presintering, milling, welding, reduction and powder screening. Physical properties and compositions of 10 cemented carbides produced during the war are listed. PB-1265r; microfilm, \$5.00; photostat, \$17.00; 245 p.

French Carbide Plants—Two French tungsten carbide plants which were used to produce cores for projectiles during the war are reported on. Raw materials, processes, products and German activities are discussed. PB-313; mimeographed, 25¢; 12 p.

Oil Standby Equipment Proves Value in Gas Shortage

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Champion Spark Plug Co.
Toledo

AS is so often the case in industry, an entire plant is dependent for continuous production on a comparatively small and simple function. At Champion, where the manufacturing operation depends for continuity on continuous operation of the blueing furnaces, a department which employs only a few men—less than 1 pct of the total employment.

The plant is located in an area where transportation facilities limit the reserve supply of natural gas, which is piped from as far as Texas. The supply is adequate except for emergency periods of severe and prolonged cold weather, when the threat of greatly curtailed gas supply in winter months is a serious problem.

To insure continuous operation independent of gas supply, oil standby equipment was installed last fall, see figs. 1 and 2. The furnace in which this installation was made is a pot-type salt bath furnace manufactured by Surface Combustion Corp., Toledo, and has twin pots 5 ft long x 15 in. wide x 12 in. deep. Four low pressure gas burners fire the furnace, two at each end. Sodium nitrate is the salt employed for blueing, fired to about 1000°F.

The oil standby equipment consists of an oil jet which fits inside the tunnel-type gas burner, through the tee in the pipe connection; an oil line, a high pressure air line; and control valves and instrument.

Oil used is no. 3, stored in a 10,000-gal tank approximately 100 ft from the furnace room. The oil jets remain permanently in place, and are not removed when gas firing is resumed. High



FIG. 1 - Pot-type salt bath furnace used for blueing spark plug shells at Champion Spark Plug Co. Its two gas burners are equipped with oil standby equipment to insure uninterrupted operation during gas curtailment periods.

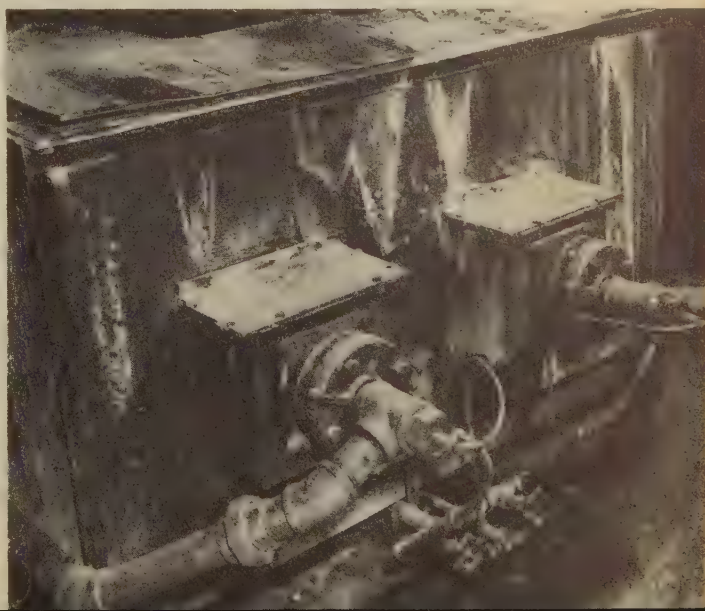
air pressure is introduced to atomize the oil, at approximately 70 psi or less. Low pressure air for combustion is fed at about 16 oz, as it is for gas firing.

When making the changeover from gas to oil, all that is required is to close a valve in the gas line and to open valves in the oil and high pressure air lines. Changing back from oil to gas merely reverses the process.

With the standby equipment not a moment of production time was lost this past winter, despite curtailment which closed or seriously hampered production in nearby plants.

In addition to assuring an uninterrupted flow of spark plugs to customers, a worthwhile improvement in employee relations was achieved, because not a single employee lost work time through the winter due to furnace failure. The

FIG. 2 - A closeup of the SC oil standby equipment as installed in the blueing furnace.



standby equipment proved to be reliable and trouble free. The plant operated on oil through many days in January and February, and no difficulty was encountered in maintaining temperature when the changeover was made from gas to oil.

Installation time was a matter of a few hours; changeover is made in 10 to 15 sec. Consumption of oil averaged 19 gal per hr. There is no doubt that oil firing is more expensive than gas firing, but it is materially less expensive than a shut-down.

Materials Handling Trucks Serve as Mobile Scaffolds

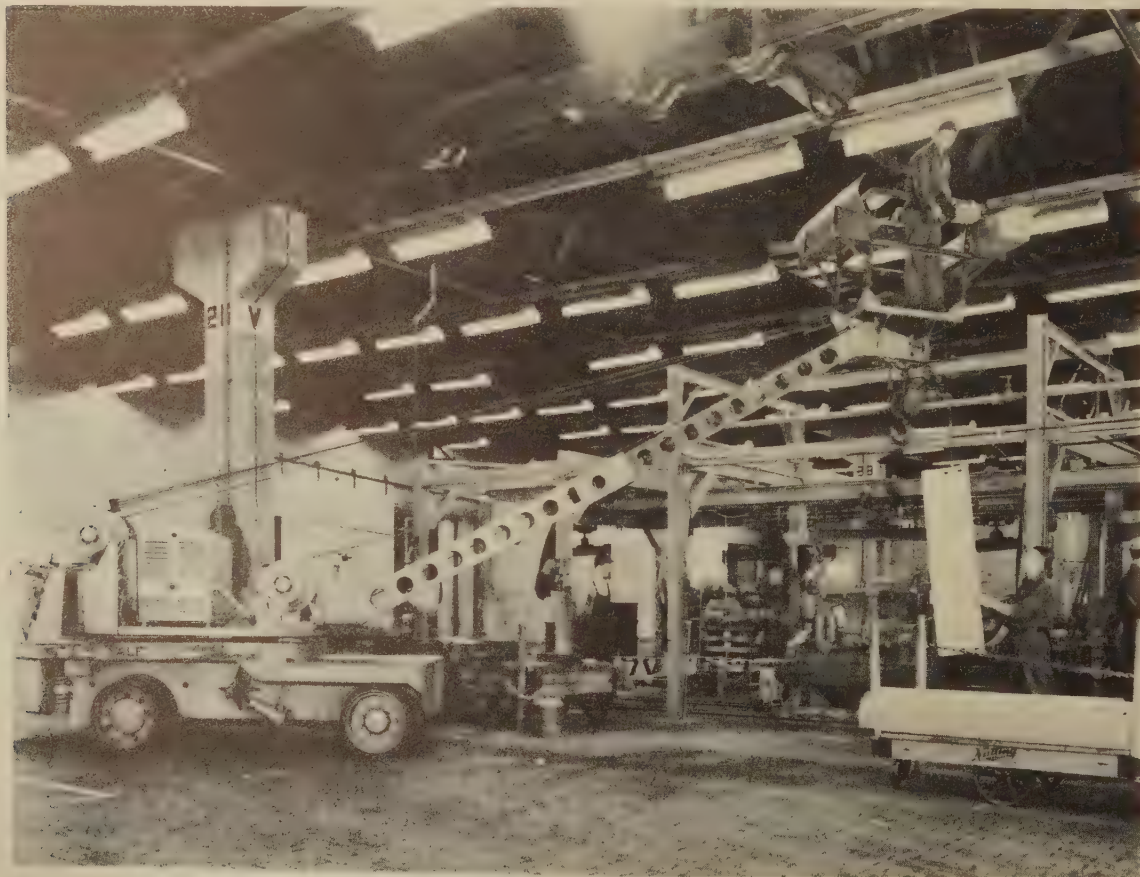
SERVICING of overhead plant installations can often be efficiently done from a platform mounted on the boom of a crane truck or by using high lift fork or platform trucks. The accompanying illustration shows a Yale & Towne crane truck being used for servicing overhead piping, air conditioning units, conveyers, sprinkler systems, skylights and high windows in addition to performing its regular duties of loading and unloading rail cars and handling raw materials in the plant yard.

Scheduling trucks for such maintenance usage

in off duty times, as between rail shipments or at night, will not interfere with plant operations and saves the expense of building scaffolds or using ladders. Mobility of the trucks proves especially valuable in painting ceilings, checking wiring and doing other maintenance work where it is necessary to follow along the entire length of the job.

The platform can be rigged with safety railings and can be equipped with outside racks or boxes for materials and tools.

Mounting a platform on the boom of the crane truck has converted it to a mobile scaffold for the maintenance or installation of overhead plant equipment.

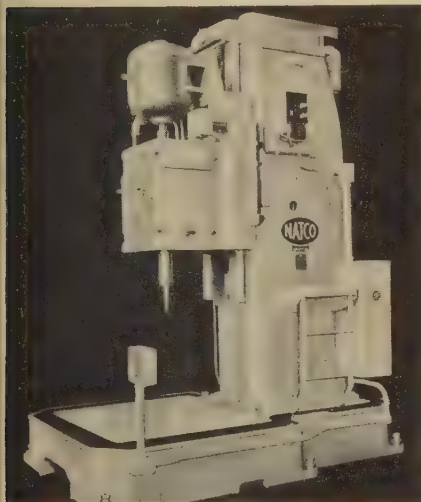


New Production Ideas . . .

Machine tools for testing drill life, making parts from tubing, die filing, vertical honing, boring car wheels, and machining automotive manifolds are discussed in this issue. A welding timer control, an aluminum melt control, a foundry dust arrester, a fluorescent analyzer, and various small tools and accessories are also described.

Drill Testing Machine

A NATCO drilling machine which operates at peak efficiency under abnormal or overload conditions in drill testing, is equipped with a heavy-duty single spindle 7-speed geared head. The 30-hp motor maintains a synchronous speed up to the rated hp when drills become dull. As the load



builds up to a predetermined value, a torque limiting device operates to stop the motor. A shear pin arrangement is also provided to prevent destruction of gears in the head in the event of serious overloading. A range of 42 speeds is possible through change gears. This machine is marketed by *National Automatic Tool Co.*, Richmond, Ind.

Single Spindle Automatic

MODEL SST single spindle automatic has been designed particularly for making parts from tubing where simple operations such as turning, forming, straight or taper boring and cut-off are re-

quired in mass quantities. According to the manufacturer, *National Acme Co.*, 170 E. 131st St., Cleveland 8, the machine is suited to the application of high speed or carbide tipped tools for precision tolerances at output rates higher than have been accomplished by other machines built for similar purpose. By changing sheaves, spindle speeds range from direct with 1800 rpm motor down to 900; with 1200 rpm motor down to 600; with 50 cycle 1450 rpm motor, down to 725 rpm. End working slide is a combination type from which straight or taper boring and outside radii turning can be done simultaneously. Feed mechanism, which controls the camshafts, drums and cams operating the slides and stock feed stop, are gear driven from main spindle. The 2 and 3-in. capacity machines are equipped with standard stock feed mechanism for tubing lengths up to 16 ft and the unit can be modified for 20-ft stock. On the 6-in. machine maximum length of stock handled is 12 in.

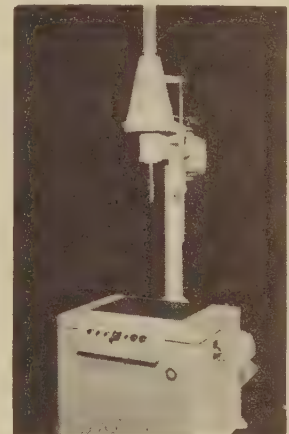
Filing Machine

A BENCH type reciprocal filing machine, Model FS, is designed to perform all three die making operations of filing, sawing and lapping, without changing the overarm. The overarm is described as a deep-throated all purpose unit equipped with an upper chuck in the overarm assembly to make possible chucking files, saws or lapping sticks at the upper as well as the lower end. Spring tension on saws and thin files is adjusted by moving overarm assembly up or down. Chucking may be done close to the work. A ball joint permits alignment of files with warped, cracked or twisted shanks before they are clamped in working position. Caps have serrated faces, with V-grooves,

to grip and align files, saws, or stones of various shapes. The machine, known as the Model FS Milwaukee Die Filer, is introduced by *Rice Pump & Machine Co.*, Milwaukee.

Honing Machine

A SMALL size single spindle hydraulic honing machine known as Model 412 has been added to the line of vertical honing machines



produced by the *C. Allen Fulmer Co.*, First National Bank Bldg., Cincinnati 2. The machine is offered to meet requirements for both general purpose work and production runs on small parts and is designed for rapid honing of any type of internal cylinder ranging from 1/2 to 4 in. in diameter. Maximum honing stroke is 12 in. Reciprocation is by means of a hydraulic cylinder designed to allow any reciprocating speed from 0 to 80 fpm, regardless of length of stroke setting. Spindle is driven by a separate 3-hp motor to permit excess power when needed and is designed for production type honing tools. Three spindle speeds are

obtained through cone pulleys and a V belt. Work table is 18x24 in. with T slots, can accommodate work pieces up to 21 in. OD. The machine is 100 in. high, weighs 2500 lb and requires 41x48-in. floor space.

Car Wheel Borer

AUTOMATIC table brake in conjunction with the automatic feed and traverse cycle, is a fea-



ture of the redesigned high-speed Betts hydraulic feed car wheel boring and hub facing machine. A product of *Consolidated Machine Tool Corp.*, Rochester, N. Y., this unit provides high speeds for carbide and high speed steel tools, and also automatic speed reduction electrically between roughing and finishing speeds when desired, making it possible to use combination tooling. Table stops automatically before spindle starts its upward traverse in order to prevent scoring of work. Table is sealed for use of coolant. Capacity of machine is 17 to 48-in. cast iron or steel wheels using 5-jaw automatic self-centering chuck.

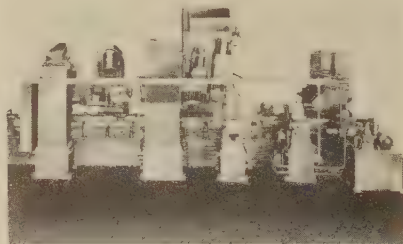
Carbide End Mills

SINGLE and double solid carbide end mills are now in production at *Raymac Mfg. Co.*, 3729-1 Cass St., Detroit, 1. Doubled speed of operation, increased wear and saving in set-up time are advantages listed. Regrinding economy is claimed to result from these mills holding size longer than steel. Raymac end mills are ground for uniformity and manufactured in straight shanks only. They are available from 1/16 to 9/16-in.

cutter diam. Shank tolerances are from plus 0.000 to minus 0.001; cutter head from plus 0.001 to minus 0.001. Special sizes and tolerances may be ordered.

Manifold Machining

PRODUCTION of 60 parts an hour at 80 pct efficiency is offered with the introduction of a transfer type machine designed to complete in a work cycle of 48 sec, 57 holes on faces on an automotive intake manifold. This machine has a total of 13 stations; one loading station, 11 work stations and one unload station. Parts are indexed from station to station by a hydraulically actuated shuttle. Loading fixture, the 11 work fixtures and the unloading fixture are mounted on the machine bed which is made in five sections, cross-keyed and bolted together. Hydraulic piping and wiring is provided with junctions so that the machine can



be moved in five sections and reconnected. Bed and columns are welded steel, normalized and ribbed. Built by *Snyder Tool & Engineering Co.*, 3400 E. Lafayette St., Detroit, this model is equipped with six Snyder standard self-contained hydraulic units which carry multiple heads and bushing plates, two Snyder standard slide units and one Snyder standard tapping unit with multiple spindle head. Three special slides are equipped with multiple heads. These units, slides and heads are mounted on risers and columns at various angles as required.

Gearless Drill Heads

GEARLESS drill heads in sizes to permit adaption to Sigourney sensitive drill presses are available from *Zagar Tool, Inc.*, 23880 Lakeland Blvd., Cleveland 17. They are described as a special head wherein the housing and the drive mechanism are an integral part of the main spindle assembly. The original drill press spindle is taken

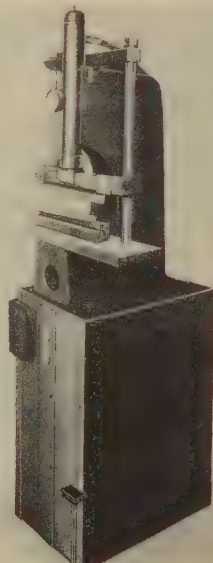
out completely and the multiple spindle drilling head inserted in its place. The gearless head has eight spindles on a 1-in. circle. Pin guide bushings are provided to tie the head in with the drill jig. These heads may be adapted to other drill presses.

Tap Holder

THE redesigned Tool-Flex Neo prene mounted releasing tap holder that simplifies tapping on turret lathes, drill presses, screw machines and engine lathes, has been announced by *Burg Tool Mfg. Co.*, 5928 W. Jefferson Blvd., Los Angeles 16. Blind hole tapping or tapping to a definite stop is possible since the turret is set to travel a fixed depth, after which the holder permits the tap to spin freely with the spindle. When the spindle is reversed the holder locks the tap and backs it out. The end play provided in the holder prevents tearing of threads when backing out.

Hydraulic Press Brakes

HYDRAULIC press brakes in 10, 20 and 30-ton capacities which may be converted to hydraulic presses by removing cross rods



tie rods and bed, are now available from *Munton Mfg. Co.*, 9400 W. Belmont Ave., Franklin Park, Ill. The 10-ton model handles 18 gage stock 3 ft long, 14 gage stock 2 ft long and 10 gage stock, 1 ft long. The 20-ton unit handles 12 gage stock 3 ft long and the 30-ton unit will take 10 gage stock 3 ft long. All three make 90° bends in mild steel. The 10-ton model is used for

forming only, unless the die sets have springs to brake punch and die. Dual cylinder model, providing pressure down and up, is recommended for punching, broaching and pressing operations. There is a 9-in. throat between guide rods which are 20 in. apart and 3-in. throat from guide rods out.

Welding Timer Control

A NEW timer control for use with the company's MSW portable spot welder has been announced by *Miller Electric Mfg. Co.*, Appleton, Wis. It is said to insure maximum efficiency, produce more uniform spots, increase the life of the tips, and make the machine satisfactory for production spot welding. The timer is a NEMA Type 1A, 60 cycle, adjustable from 3 to 120 cycles and operates on either 110 or 220 v current. The cycle is selected by adjusting a control on the case. A numbered indicator disk, geared to this control, indicates the cycles in use. On and off is controlled by a switch on the case. The timer can be mounted on the wall or on a work bench.

Tight Joint Welding

A SMALLER diameter size rod has been announced by *Eutectic Welding Alloys Corp.*, 40 Worth St., New York 13. Eutecrod 16, a patented alloy 1/32-in. rod to low-heat weld all steels is designed for use with Eutector Flux 16 and may be used in ring form, preplaced and heated, either by torch or induction heating. Recommended as a replacement for silver solders, it is for use where larger diameter welding rods have been found unsatisfactory.

X-Ray Diffraction

NEW fields of application for X-ray diffraction in the identification and quantitative analysis of unknown materials are claimed to have been opened with the introduction of a new machine by *General Electric X-Ray Corp.*, Milwaukee. One attachment, the fluorescent analyzer, is said to greatly extend the range of composition of materials which can be analyzed. Another group of attachments makes possible the direct recording of X-ray intensities on a continuous strip of chart paper and are said to save laboratory time by revealing both the angular placement

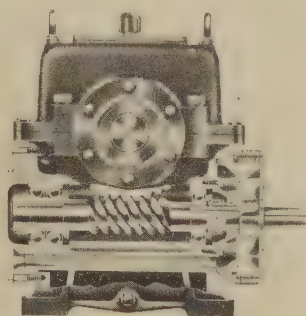
of the characteristic lines of materials and their relative intensities. Precision control of X-ray output with high X-ray intensity is claimed. The tube can be operated at milliamperages up to 30. X-ray



intensity of the unit is controllable and reproducible to an overall accuracy of 0.5 pct. This accuracy is accomplished by controlling the X-ray tube voltage to within 0.1 pct and the tube current to within 0.02 pct. The spectrogoniometer reads angles directly down to 0.01°. The instrument may be used with different attachments for three purposes: direct measurement of X-ray diffraction intensities, as a fluorescent spectrometer, and it may be employed, with X-ray-sensitive film, as a conventional X-ray diffraction unit.

Worm Gear Drives

INTRODUCTION of a new line of enclosed worm gear drives in both horizontal and vertical types and which are smaller in size than conventional drives of equal capacity, is announced by *Foot Bros. Gear & Machine Corp.*, 5310 S.



Western Blvd., Chicago 9. Increased low carrying capacity is claimed for this line and increased thermal capacity is attained with immersion in the oil reservoir of an air channel cylinder through which passes a high velocity stream of cool air. A lapped ring type seal

is used to prevent leakage of oil. These gear drives, known as the Hypower line, are available in single and double reductions in a wide range of standard ratios.

Metering Valve

A MODIFICATION of the company's forged-body industrial valve design is available from *Parker Appliance Co.*, 17325 Euclid Ave., Cleveland 12, with the introduction of a specially designed needle valve for sensitive metering of fluids and gases. This model has a 5/16 in., 40 stem threading for close adjustment, and a long 10° included angle tapered needle for fine metering. Standard valve is of high-strength brass but aluminum alloy bodies can also be supplied. Needle stems are machined to close tolerances in duronze. Valve is available in 1/8 and 1/4 in. sizes with eight port combinations of male and female pipe and tube connections.

Limit Switches

HEAVY-DUTY rotating cam limit switches which open and close up to 12 circuits at any position of the actuating cam shaft have been announced. Switches are available for 3, 4, 6, or 9 circuits only. All circuits can open or close in any sequence of elapsed time and each cam is indexed for accurate setting. Contactors on this line are known as Bulletin 801 limit switches and are manufactured by *Allen-Bradley Co.*, Milwaukee. They are individually detachable, and the shaft and cam assembly may be removed for adjustment. This switch is said to be adaptable to any programming control or time sequence operation. They are available in general purpose or watertight enclosures.

Aluminum Melt Control

A MODIFICATION of the L & N duration-adjusting type of electric control has been made to permit fuel-fired batch furnaces for melting to be brought to temperature quickly without danger of overshooting. This equipment is offered to help improve the quality of castings by preventing gas inclusions and blowholes, through limiting high-temperature swings which cause excessive formation of dross and absorption of gases. Better control of shrinkage and closer dimensional tolerances for

castings is also claimed through bringing the melt to the correct superheat for pouring. To avoid overshoot, the controller turns off the fuel supply at a predetermined point. Charge may be held at pouring temperature as long as desired. Instead of throttling the fuel valve, the control turns fuel from full on to full off. By controlling durations of on-time, this system, marketed by *Leeds & Northrup Co.*, 4934 Stenton Ave., Philadelphia 44, supplies the heat input needed to balance the heat demand of the furnace and hold temperature at the desired value.

Selenium Rectifier

OIL-IMMERSED selenium rectifier stacks, introduced by *General Electric Co.*, 1285 Boston Ave., Bridgeport 2, Conn., feature isolation from dampness and corrosive vapors, greater short-time overload because of increased thermal storage, protection from physical damage while in storage or during assembly, and large selection of ratings. The oil acts as an effective cooling medium, and the container, which has a protective coating, resists the effects of moisture, fungus, salt air, and other corrosive vapors. Insulated solder lugs on one end provide easy quick soldering connections.

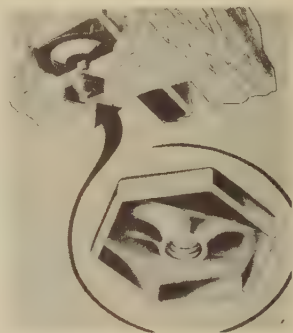
Foundry Dust Arrester

STAINLESS steel construction in a new 30,000-cfm Centri-Merge swirl-type arrester is claimed to give longer, corrosion-free operation with minimum long-range maintenance costs in the removal of dust and dirt from shakeout stations, sand handling and conditioning systems. Sludge disposal with this development of *Schmieg Industries, Inc.*, 296 Piquette Ave., Detroit 2, is by a skid on a lift truck. The conveyor drive is on top of the conveyor spout. Minimum floor space is required.

Speed Nut

DESIGNED to improve and speed the crating of stoves, refrigerators, washing machines and other heavy objects, a one-piece Speed Nut, replacing spanner washer, lock washer and ordinary nut, has been developed by *Tinnerman Products, Inc.*, 2060 Fulton Rd., Cleveland 13. This product is a self-locking nut which has a pre-

vailing torque and, when tightened in position, has an exerted pressure on the threads to withstand vibration. It is said to require no supplementary parts for resisting vi-



bration. The nut is available in 5/16 and 1/4-in sizes. The 5/16-in. size is claimed to withstand tensile loads in excess of 2500 lb.

Polishing Wheel Cement

FLEXIBILITY and exceptional adhesive strength are claimed for a new polishing wheel cement called Wheel King, produced by *Wallace A. Erickson & Co.*, 842 N. Wells St., Chicago 10. Reports show successful results with 240 and all coarser grits, including use on grease wheels and abrasive belts. It is manufactured in one form for use with all grain sizes to 240, and is applied cold.

Micrometer Attachment

THE Rimat Microadapter is an attachment for outside micrometers which is designed to make possible the measuring of internal dimensions. It is offered to tool-makers and machinists to meet the



ned for an inexpensive tool with accuracy equal to the micrometer itself. The attachment is designed to permit internal measurements to be taken with elimination of error encountered when using telescopic gages or conventional inside micrometers. Manufactured by *Richards Machine Tool Co.*, Glendale,

Calif., the unit is described as a precision instrument with hardened tool steel measuring tips and can be installed or removed in less than a minute.

Steam-Jet Cleaner

A CLEANING unit which operates free of open flame, fumes and gases which accompany the conventional type of steam cleaner is now available for industrial plant applications such as cleaning walls, ceilings, windows, degreasing machinery, equipment parts and tools. This is a portable unit which will be marketed as the Speedyelectric Steam-Jet cleaner by the manufacturer, *Livingston Engineering Co.*, 100 Grove St., Worcester 5, Mass. In operation, steam is delivered to the cleaning nozzle where, under fingertip control, a soap solution, solvent or detergent is added and atomized with the high pressure steam as it impinges on the surface. The pressure tank is designed to assure positive flow of detergent or solvent to the nozzle at rates and pressure required for the job. The unit is mounted on a dolly and weighs about 400 lb. It operates on ac current, 220 v and over.

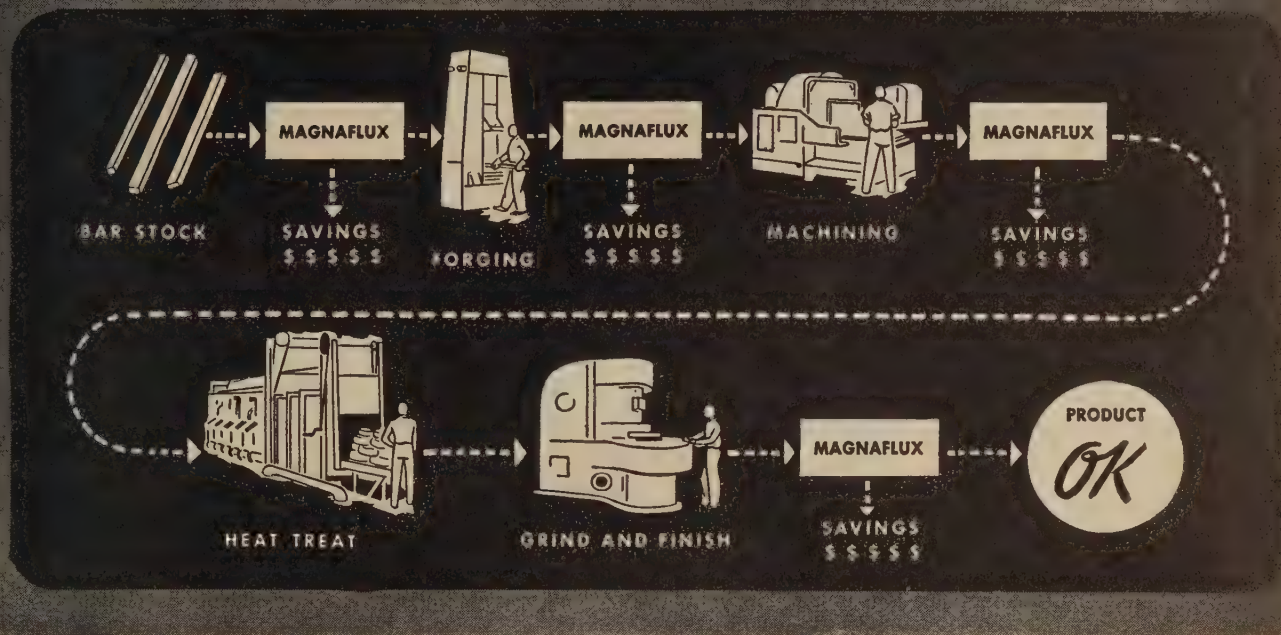
Fluxing Agent

KWIKFLUX, a fluxing agent claimed to have excellent penetrating power, is available from *Special Chemicals Corp.*, 30 Irving Place, New York 3, for all types of hard soldering, brazing and welding. It is recommended for use on stainless steel, iron, steel, copper, brass, gold, platinum silver, Monel metal, nickel, nickel silver and other ferrous and nonferrous metals and alloys. The flux works with direct flame, gas, hydrogen, acetylene and induction heating.

Centrifugal Fans

A LINE of small centrifugal fans, Type 5 CB, have a wheel diameter of 5 in. and are recommended for cooling and ventilating of electrical and electronic equipment. Produced by *Johnson Fan & Blower Corp.*, 1319 W. Lake St., Chicago 7, they may be obtained in single or double width types. A wide range of motor sizes is available. Motor is mounted concentric for compactness. Brackets and mountings are available to suit requirements. Inlet filters can be supplied to pressurize equipment cabinets with dust-free air.

How MAGNAFLUX* Production Line Inspection CAN CUT YOUR MANUFACTURING COSTS



Defective parts are rejected *before* additional money is spent in finishing them with inspection by Magnaflux on the production line and trouble is found and corrected when it occurs—not later. For many plants this method of inspection is already saving thousands of dollars in manufacturing costs each year.

For example, by inspection with Magnaflux a gear manufacturer is able to reject defective pieces of material in bar form, or after forging. He saves the cost of machining,

heat treating, grinding and finishing many pieces which would later be rejected at final inspection. In rejecting still more pieces after machining, with a third Magnaflux inspection, he saves the cost of heat treating and grinding.

Add up the total savings made by cutting out subsequent steps for all rejects. You'll see that *total* cost of inspection is *much less* than cost of carrying all defective parts to finish stage. Here is a table showing these savings:

Table Based on Processing 1000 Parts	Processing Cost Investment	Rejects Due to Operation	Savings in Cost to Finish	Inspection Costs all Parts
Bar	\$ 1.00	10	\$190.00	\$ 70.00
Forging	3.00	10	170.00	69.30
Machined Gear	11.00	10	90.00	68.60
Ground and Finished Gear	20.00	20		67.20
		50	\$450.00	\$275.10

Inspection with Magnaflux not only pays for itself, but gives a net savings of \$174.90 per 1,000 gears. This example is based on 100% inspection after each operation except heat treating. However, sampling methods often can be used for similar in-process inspection to cut manufacturing costs.

Magnaflux, and other Magnaflux Corporation non-destructive testing methods, make cracks and other defects readily visible for inspection of every part at production line speed. Write today for full information on how Magnaflux can help you raise product quality and cut production costs.

*Magnaflux, Reg. U. S. Pat. Off., a trade mark of Magnaflux Corporation applied to its equipment and materials for magnetic particle inspection.

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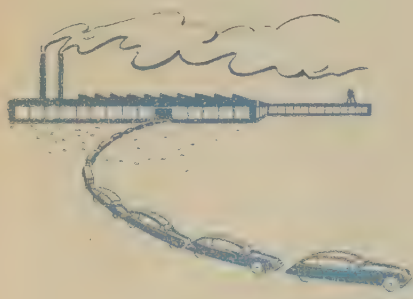
CLEVELAND

THE IRON AGE, September 16, 1948—99



Reg. U. S. Pat. Office

• Detroit labor greets President Truman . . . Hudson introduces its new convertible . . . Foundry strike at CWC is settled . . . U. S. Rubber reports on technical progress.



DETROIT—This was labor's week in Detroit.

In an unprecedented demonstration of solidarity, the UAW-CIO and the AFL marched side by side in a huge Labor Day parade that served as the kick-off for President Truman's 1948 campaign. The parade lasted 2½ hr and despite scattered light showers, an estimated 100,000 persons took part in the huge demonstration at Detroit alone.

Thousands of people lined the streets as the President traveled by motor car to Pontiac following his Detroit speech. Later he went on to Flint where an estimated 120,000 people turned out. President Truman also visited Lansing and Grand Rapids on his current junket into Michigan.

As expected, the President tore into what he called Republican reactionaries and a "Do Nothing" Congress. In Detroit the crowd was quiet and responded more noticeably to the fiery oratory of ambitious Walter Reuther whose greatest hope is to organize and unite labor to the point where it becomes the controlling element in American politics. Mr. Reuther has

already gone on record as envisioning "actual labor unity before another Labor Day." Detroit sources, incidentally, are not underestimating Mr. Reuther's political abilities.

In Detroit the crowd was orderly and relatively undemonstrative, except when the name of Franklin D. Roosevelt was mentioned. "Fellow travelers" were on hand as expected. A dozen or more placards proclaimed, "Ford Workers for Wallace" and "Wallace or War." Incidentally, the Ford 600 float depicting the Taft-Hartley law as an evil dragon won first prize.

Using placards, sound trucks, floats and any other means available to them, the workers left no doubt that their cherished ambition is abolition of alleged antilabor laws and defeat for the members of Congress who voted for them.

All that remained now was to see how many of the Labor Day cheers were going to be counted as votes at the ballot boxes in November. It was apparent enough to observers here that Michigan labor's political plans and ambitions for 1948 are probably as well, if not better, organized than at any time in the past. The big question was, will the present campaign peter out in undistinguished fashion as all its predecessors have done.

* * *

After vetoing an earlier contract proposal, agreement was finally reached this week in the Campbell, Wyant & Cannon foundry strike at Muskegon. The plant had been closed for 11 weeks.

The union was finally persuaded to drop its all-out demand for the union shop. The new contract provides for maintenance of membership and calls for dues checkoff where the employee authorizes the deduction. Wage rates are boosted 11½¢ to 13½¢ per hr. The incentive pay features of the CWC operation remain and workers operating on this system also received pay boosts in addition to six paid holidays a year. In addition there were some fringe payments which union leaders declare will bring the total pay package up to 18¢ per hr.

Meanwhile, many of CWC's customers have been forced to make

other arrangements for camshafts and motor blocks during the prolonged shutdown of the foundry. While CWC executives are confident the old customers, including most of the major producers as well as prominent independents, would be back, some sources were not so sure in the event that their new arrangements prove satisfactory. It appeared that at least a week must elapse until the huge Muskegon plant will again operate at prestrike production levels.

* * *

SETTLEMENT this week of the New Haven, Mich., foundry strike and termination of the 2 week International Harvester tie-up just about cleared the labor skies in the auto industry for the present. A symptom of developments that might cause trouble later on, however, was the shutdown of DeSoto. This was nominally attributed to the heat but many observers here felt the stoppage had all the distinguishing marks of growing factionalism in the UAW-CIO. In addition, it was indicated that if the opportunity was presented to certain elements in the union, wholesale speedup charges by the union might break out at any time along the automotive labor front.

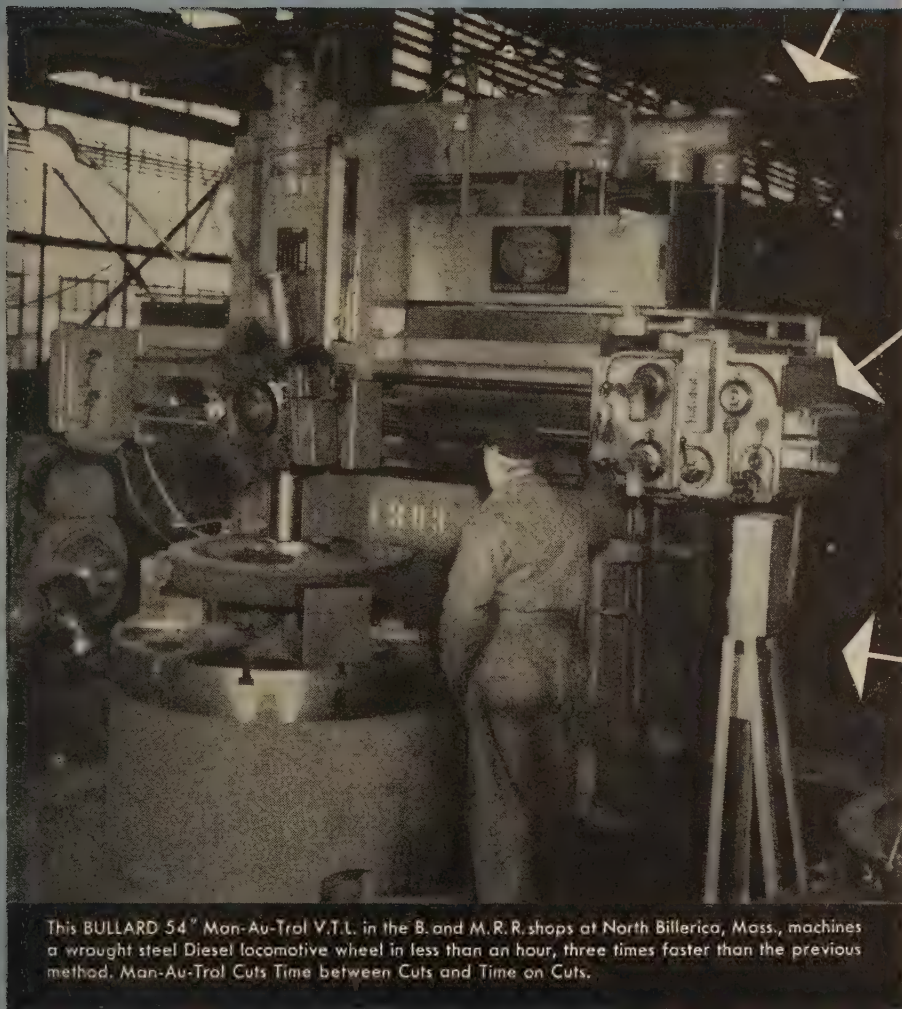
* * *

THIS week Hudson held a showing for the press of its new convertible brougham. Hudson engineers predict the new model will establish new standards of rigidity and freedom from rattles in this type of car.

The new convertible features the integrated body-and-frame construction Hudson has developed, and the low silhouette and long sweeping lines of Hudson's closed cars; it also incorporates the "step-down" principle and low center of gravity.

Perhaps the most unusual feature of the new car is the windshield "header." This interesting box-type construction adds to the overall rigidity of the car and also supports the twin sun visors and the radio antenna control knobs. Hudson engineers have devised a new "Foldaway" window which

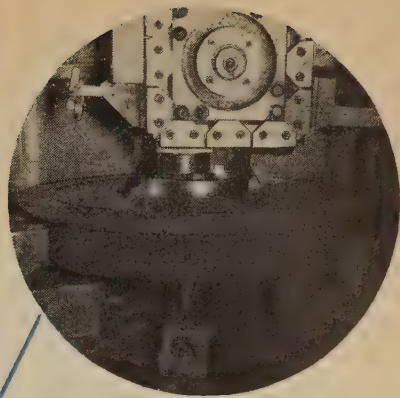
BULLARD MAN-AU-TROL V. T. L. AUTOMATICALLY MACHINES DIESEL WHEELS 3 TIMES FASTER



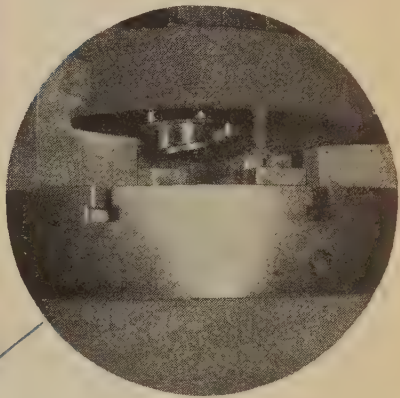
This BULLARD 54" Man-Au-Trol V.T.L. in the B. and M.R.R. shops at North Billerica, Mass., machines a wrought steel Diesel locomotive wheel in less than an hour, three times faster than the previous method. Man-Au-Trol Cuts Time between Cuts and Time on Cuts.

Your investigation of BULLARD Man-Au-Trol for your work will convince you that its combination of versatility, accuracy, productivity, cost-cutting ability is hard to beat. Write for Bulletin MAV-G-1, today, THE BULLARD COMPANY, Bridgeport 2, Connecticut.

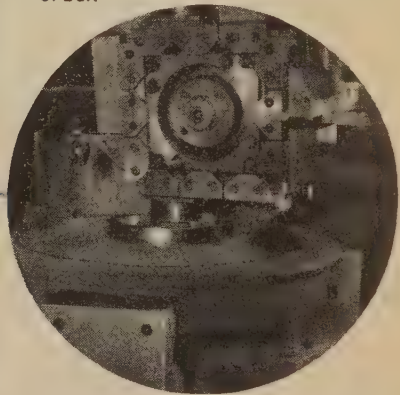
BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE



Here the boring tool and turning cutter on B. and M.'s Man-Au-Trol V.T.L. have nearly finished their cuts. When finished, the head moves to the right to straddle face the hub.



View from underside of wheel showing boring tool at end of cut, ready to move to the right to take straddle cut. Note lower straddle cutter on right side of bar.



Here you see the finish of the hub straddle facing operation. Now the head and bar move left to center of bore and rise to index position for next operation.



practically doubles the area of rear vision when the top is up. The plateglass area is hinged in the middle with vinyl plastic so that it folds neatly down into the body when the top is lowered. The same curved windshield and large windows used on the closed models are specified.

As is the case of practically all higher priced convertible models, automatic control buttons are available for raising or lowering the windows and top.

Hudson is offering an antique red leather upholstery or two leather-and-cloth combinations. The top is available in black or gray.

has been spent for engineering and tooling on the new convertible, it was disclosed.

The new Hudson convertible utilizes diecastings at a number of points where stampings were formerly used. The cars come equipped with Hudson's Drive-Master automatic transmission at extra cost.

Hudson hopes that production of the new convertible model may reach 15 pct of the company's volume. Sales officials explained that thus far Hudson's participation in the convertible field has been relatively low and the company hopes to strengthen its position in this market.

RIGID MODEL: *Hudson engineers believe that their new convertible brougham recently introduced in Detroit is the most rigid convertible now on the market. Special die cast fittings and the addition of structural members at vulnerable points have added to the stiffness of the structure. A box-type header across the top of the windshield also contributes to overall rigidity.*



Hudson engineers have taken some novel steps to achieve rigidity in the new convertible. A longitudinal Z-member has been added inside the box section side rails. This runs from the dash to about the point where the "step-down" ends. The Z-member is welded to the side rails and braced transversely at intervals.

A flanged, U-section, 8-in. member, running from the door pillar to the wheel house, has been added. This is welded to the frame.

A permanent additional support rail runs from door to door at the belt line. This is supported by a vertical, ribbed bulkhead welded to the rail, floor and wheel house.

The large windshield header and the members supporting the top also help to provide increased rigidity. The top members are about twice the width of those on other convertibles.

Hudson officials disclosed that the tooling cost for the new convertible actually exceeds the tooling cost for the entire prewar line of Hudson cars. More than a million dollars

The growing popularity of convertible models is evidenced from the fact that more than 5 pct of all cars being built today are convertibles. A few years ago convertibles accounted for only 1 or 2 pct of the total automobile market.

The new cars are priced at \$2657 to \$2940, Detroit, excluding license, dealer handling, state and federal taxes, options and accessories.

TO provide additional luggage space, the rear seat of the new deluxe Oldsmobile station wagon may be lowered into the floor. The back of the rear seat is upholstered with the same fabric as the rest of the floor and stainless steel skid rails are being used to protect the carpeting against excessive wear. Stainless steel skid rails are also employed along the sides to protect the wood finish. Red leather trim protects the lower portion of the doors from scuff marks. The tail gate of the deluxe model Oldsmobile also utilizes stainless steel skid rails.

When the rear seat is folded

down, the new Oldsmobile station wagon provides 84 in. of space behind the front seat and a width of 47 in.

The new body style is being built by Fisher Body Div. of General Motors, now included in the 1948 Oldsmobile line of cars.

Oldsmobile is currently using a new device called a Cavitometer for 100 pct inspection of cylinder head cavities of its 8-cylinder engines. The machine is said to be capable of inspecting cylinder heads at the rate of 150 per hr. It will register differences in volume capacities with the accuracy of one part in 1500. Sensitivity to volume change in cavities is said to be one part in 50,000.

The previous method of measuring the cavities of motor block heads was to pour fluid into them and measure the cubic centimeters of liquid contained.

The Cavitometer operates on the principle that all cavities with a certain throat opening have a natural frequency at which they will resonate. When the motor block head is placed in a Cavitometer it reflects a sonic wave that may be compared with a master cylinder head cavity of known sonic frequency. The difference between these two is then interpreted in volume measurement and is indicated on a dial.

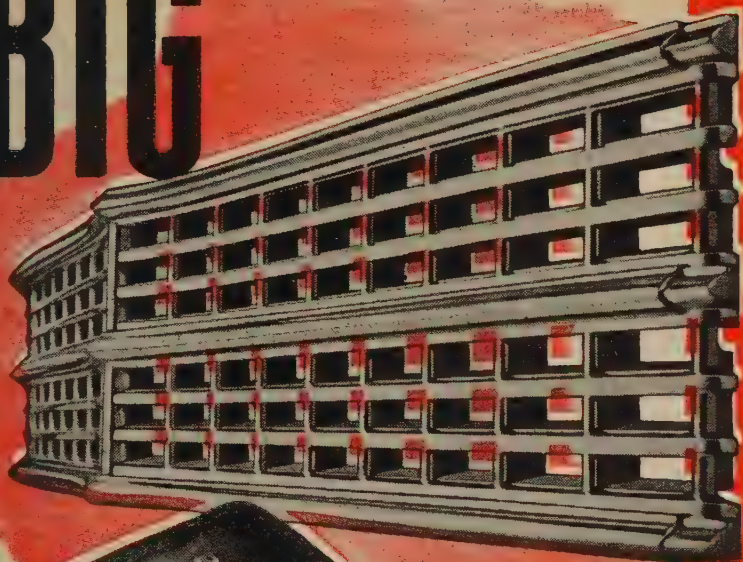
The various cylinder head cavities are measured automatically in sequence. If any one of them is "out of volume" the fact is registered on a dial. Olds engineers predict the Cavitometer will be used even more extensively in the future.

* * *

THE U. S. Rubber industry is one of few major industries in which production has kept pace with or actually exceeded demand. Millions of dollars poured into research and new production facilities have paid off for the rubber industry.

Proof of this statement is found in a recent disclosure by U. S. Rubber Co. of some of the postwar developments carried forward by that company. New plants have been built in Chicago; Washington, Ind.; Fort Wayne; Scottsville, Va.; Burlington, N. C.; Milan, Tenn.; Manchester, N. H.; and Gastonia, N. C. Postwar expansion and modernization has cost the company \$80 million to date, including \$30 million spent since the war on tire production facilities, and \$50 million on nontire products.

BIG



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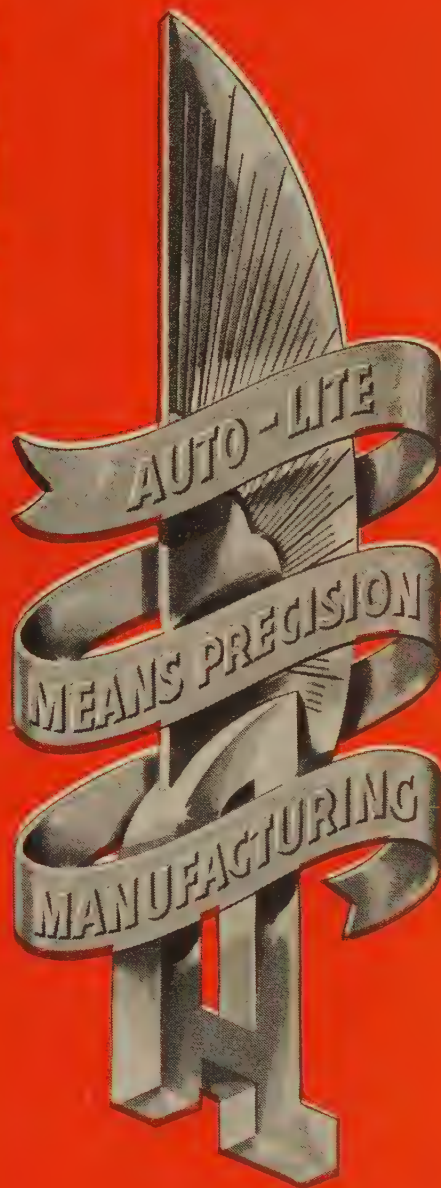
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AND PLATING OF ZINC
AND ALUMINUM DIE CAST PARTS

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Thursdays, 9:00 P.M.—E.D.S.T. on CBS

• Commerce Dept. perks up... Secretary Sawyer emphasizes domestic economy... New policy on exports... Long range steel demand studies seen of little value.



WASHINGTON — There's a new look around the Dept. of Commerce. Buffeted between politically-minded and internationalist Secretaries of Commerce since 1932, Commerce employees felt that a political mediocrity was being foisted upon them when Charles Sawyer, Ohio Democrat, came in to replace W. Averell Harriman as Secretary last May. An almost certain Dewey victory in November added to the feeling that Mr. Sawyer would just be marking time.

Such was not to be the case. Mr. Sawyer has pitched into the job and is making his own policies in a manner which old line Commerce employees say is reminiscent of the days when Herbert Hoover lifted the department to its highest peak. An exclusive interview with THE IRON AGE confirmed this view.

The most notable change in the department since Mr. Sawyer took over has been his emphasis on the importance of a healthy domestic economy—a theory long discarded by the 2-qt.-of-milk-for-every-Hot-tentot-school.

A practical, level-headed individual, Mr. Sawyer recognizes the importance of United States for-

eign trade as well as the need for shipments overseas to aid European recovery, but he is also aware of the fact that the Dept. of Commerce is responsible for fixing the total amount of industrial items in short supply which may be prudently exported from this country. He takes this responsibility seriously.

Previously, export requirements were regarded as something sacred—"do not disturb"—was the motto. The department's Office of International Trade was in the saddle and riding high. This is not the case at present. Mr. Sawyer told THE IRON AGE that export requirements are now being viewed in the light of domestic needs and availabilities and while considered on an equal basis with domestic needs they are no longer on a separate and higher plateau.

UNDER this policy, the Office of Domestic Commerce is now given an opportunity to look over export requirements instead of being told "this is the quantity to be exported, take it or leave it." As a result of this policy, a complete review of domestic steel needs has been prepared for Mr. Sawyer so that export requirements may be more realistically arrived at within the various offices of the department.

As far as detailed statistical studies of supply and demand are concerned, Mr. Sawyer's general feeling is that while any type of information is helpful, there are limits beyond which statistical effort cannot be pushed. Regarding steel, THE IRON AGE came away from an interview with Mr. Sawyer with the impression that he feels that a long-term steel demand study is unnecessary, and that time might be spent to better advantage by working with the steel industry to maintain and increase production.

While not minimizing the seriousness of steel shortages, Mr. Sawyer does not believe that steel demand will always be so far ahead of available supplies, and, consequently, feels that a long-term steel

demand study, which could not be completed for several years, would be of little practical value.

Another example of Mr. Sawyer's concern over the well-being of the domestic economy is his policy regarding government aid in increasing the supply of iron and steel scrap. From the end of the war until early this year all government departments talked about getting scrap from Germany, but little was accomplished.

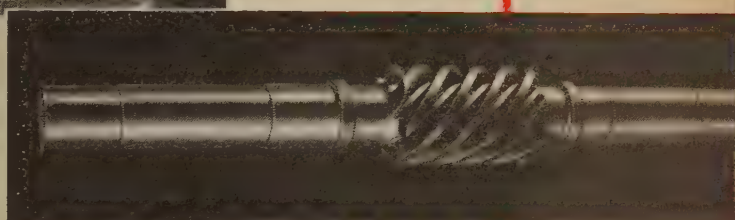
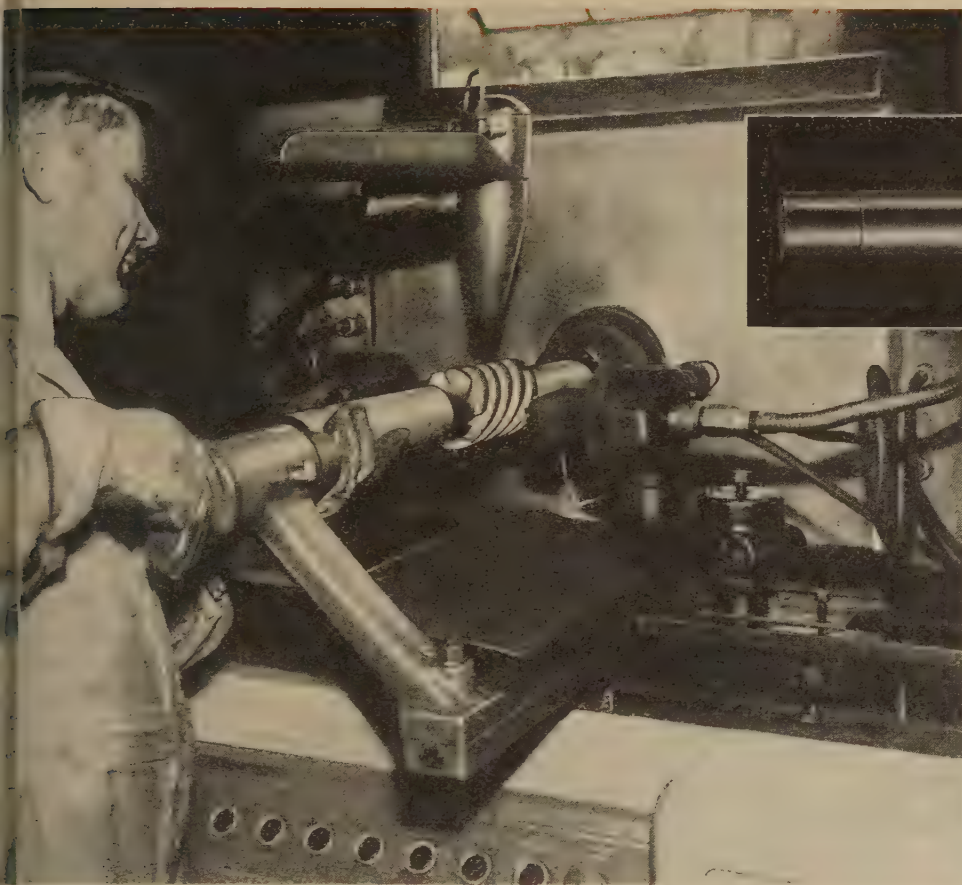
MR. SAWYER concentrated all government scrap efforts in the Dept. of Commerce, brought in Alex Miller, peppery Cleveland scrap dealer, and gave him a free hand. Accomplishments to date include actual movement of substantial tonnages of scrap from Germany, the launching of a nationwide industrial scrap drive, and the possibility of setting up a private corporation to act as exclusive buying agent for German scrap.

The story is told around Washington of a meeting at which representatives of many government departments were discussing German scrap. Mr. Sawyer had been in his new post only a few weeks when he walked into the meeting. He was greeted with a long-winded discussion concerning the allocation of German scrap which was not yet available. His only comment ran something like this: "Let's get the scrap, then allocate it." Since that time, the department has been doing just that.

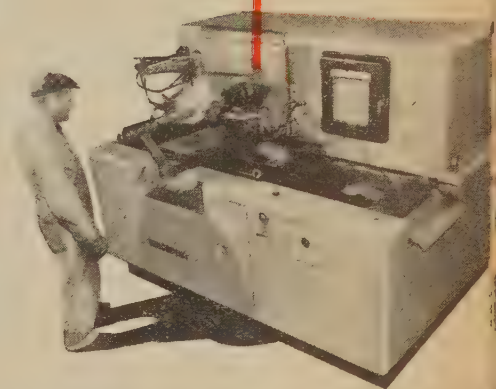
The voluntary allocations program, a relatively new experiment in government relations with industry, has been enthusiastically supported by Mr. Sawyer. He told THE IRON AGE that in his opinion the program has been successful, but added that such a program cannot be used to satisfy all consumers of steel.

Having allocated about 10 pct of the total steel supply, Mr. Sawyer feels that a limit will be approached beyond which the whole distribution system will be adversely affected. The program will not go

1 operation instead of 3



part:	worm shaft
length:	27 1/2"
O. D. at worm:	2 1/2"
material:	SAE 4615 carburized .04"
hardening time:	40 seconds
surface hardness:	58 to 61 Rc
depth of hardness:	.046"
operation:	harden worm section



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Flamatic selective surface hardening eliminated a lot of troublesome work

For Accurate Steel Treating Co., Chicago, Ill. Prior to the use of Flamatic hardening, their worm shafts were case carburized, the case then machined off several diameters, then furnace hardened . . . and finally shafts annealed, prior to machining threads and keyways. This required wasteful shuttling of the work pieces between the part manufacturer's plant and Accurate Steel Treating Co.

Flamatic hardening eliminated two operations, and made everybody happy with a better product at lower unit cost. Here's how: after carburizing to a depth of .046", the threaded section of the shaft was Flamatic hardened to 60 Rc. Hardening time: 40 seconds. Distortion: well under .02". Rejections: none.

Flamatic's exclusive electronic temperature control stops flames within plus or minus 5°F of desired preset value, at which point the operator removes shaft and places it in the oil quench. (Parts within Flamatic size capacity do not require manual unloading, but are automatically stripped off work arbor and deposited in the quench tank in the Flamatic machine.)



THE CINCINNATI MILLING MACHINE CO., CINCINNATI 9, OHIO, U.S.A.

beyond this point if Mr. Sawyer has anything to say about it. The decision to allocate 59,000 tons of sheet and strip to the steel prefabricating industry is a good illustration of Mr. Sawyer's thinking on the voluntary program.

FULLY realizing that this tonnage would be hardly more than an experimental allocation if the steel houses caught on with the consuming public, Mr. Sawyer nonetheless felt that the allocation should be made. He told THE IRON AGE that this allocation appears to be one way to settle this controversy—in other words, if the all-steel house does not make good, then the public should know about it, if it catches on then someone will have to decide whether steel will go into automobiles or houses.

Mr. Sawyer may only hold this post until next January, but, if this is the case, the incoming Republican Secretary will find an esprit de corps among most Commerce employees that was conspicuous by its absence during the long, dark years of Roper, Hopkins, Jones, Wallace and Harriman. A hard worker, he has no undersecretary to assist him, Mr. Sawyer is readily accessible to his employees and quick to

commend any of them for a job well done. Already a successful attorney, publisher, businessman, and diplomat, Mr. Sawyer can, in future years, look back with pride on his having raised the Dept. of Commerce out of the depths of bureaucratic doldrums.

See Less Steel Loss Due to Pittsburgh Gas Shortage This Winter

Pittsburgh

• • • If the coming winter turns up no worse weather than the last the steel loss in this area will be less than it was then. It will be recalled that during January and February of 1948 production of more than 100,000 tons of steel was curtailed due to cold weather. Thousands of tons of steel were lost due to shortages of natural gas. Loss from shortages of gas is not expected to be as serious this winter, weather factors being equal.

Executives of the three natural gas companies serving the area queried recently by THE IRON AGE were less pessimistic than they were at this time last year. But supply will still trail demand and

some curtailments are certain. No gas company official would estimate how much better supply will be this year.

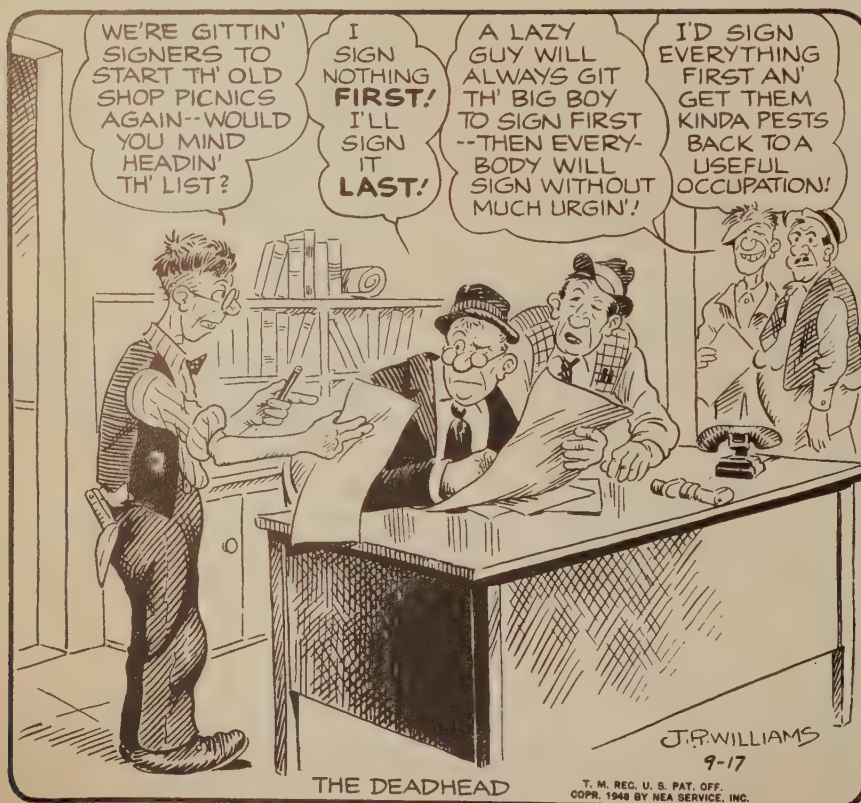
One said his company's storage capacity in the district had been stepped up by 35 pct; another has increased its holding facilities by 25 pct. Old wells are largely used for this storage. A gas company that had curtailed supply to industrial users from Nov. 1 to Apr. 1 last season according to a previous plan now intends to curtail its industrial users only from Jan. 1 to Apr. 1 of 1949.

Local lines are adequate, it was said. The need is increased transmission lines from the Southwest. If the weather is good this fall more line will be laid, with a further slight improvement in next winter's prospects.

Gas companies are still advising more and better standby facilities. This winter should see less curtailment in metalworking plants here, spokesmen said, because more substitute fuel facilities are ready to go into action this winter. Steel mills have gone in heavily for standby equipment though the size of their daily demand puts a practical limit on these facilities.

THE BULL OF THE WOODS

BY J. R. WILLIAMS



International Detrola Plans Ingot Increase

Detroit

• • • International Detrola Corp. had a net profit after taxes of \$1,144,745 after 9 months' operation, according to C. Russell Feldmann, president.

Sales volume for the period totaled \$50,506,055 compared with \$53,028,516 in the first 9 months of 1947.

Mr. Feldmann said the present monthly capacity of the company's facilities is 44,000 tons of ingots from seven open hearths and one 80-ton electric furnace. This will be increased to 60,000 tons of ingots per month with a scheduled delivery in January 1949, of two additional 80-ton electric furnaces.

International Detrola expects to complete a 56-in. reversing hot strip mill in November capable of rolling 50,000 tons per month of 18 gage and heavier. The present monthly rolling capacity is about 15,000 tons.

MODERN DESIGN CALLS FOR MODERN TOOLS

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PRODUCTION
MACHINES

FOR

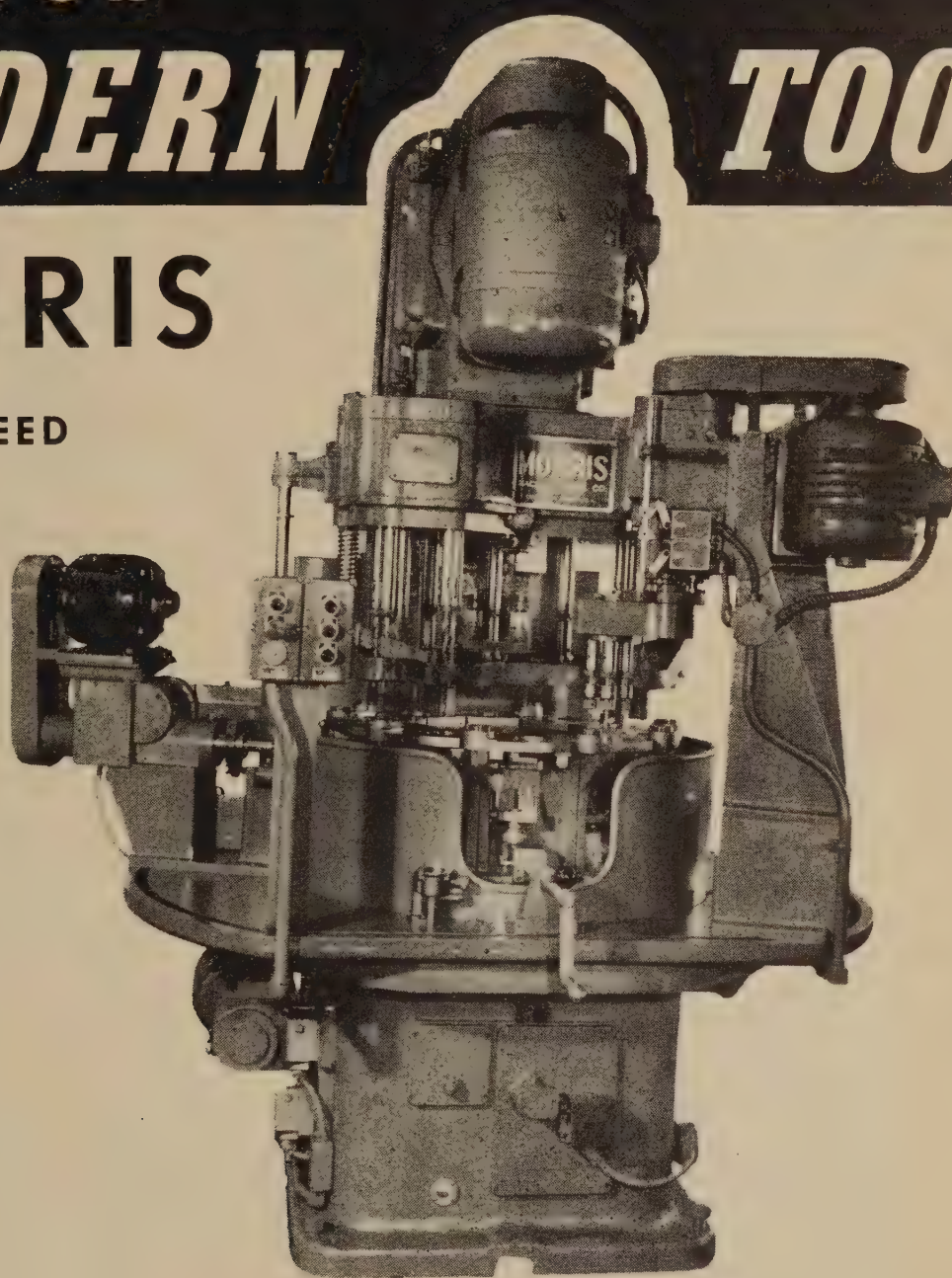
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Reaming

Chamfering

Tapping

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Ten Station
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Drilling Machine

Was designed for an automotive manufacturer to drill, ream, chamfer, and tap all of the holes in an oil pump housing. The operation consisted of: 12 vertical drilling, two vertical reaming, four vertical tapping, One horizontal drilling operations.

Designed for the production of your specific product, MORRIS high production machines are specialized equipment that will cut your costs on production runs. Each machine is designed to perform certain groups of operations, but in many instances slight changes can be made in the machine to adapt it to other jobs.

Modern design, calling for mass production, requires modern tools. For any drilling, tapping, chamfering, reaming, countersinking or counterboring operations, MORRIS has the experience, facilities to design and engineering knowledge to build the machine for you.



The MORRIS Machine Tool Co.

CINCINNATI 3, OHIO

• Kaiser price boost has negligible effect on demand . . . Scrap picture, present and future, out of focus . . . Geneva Steel gets out of housing deal.



SAN FRANCISCO — As the smoke from the explosion touched off by the \$30 average per ton steel price increase announced by Kaiser Co. Inc. cleared away, it became possible to see the practical and economic result of the price boost.

Officials of the Kaiser Co. told THE IRON AGE that cancellations and loss of business immediately following the price announcement were "negligible." According to reliable sources some of company's customers who were loudest in denunciation of the price advance have since reordered. These same sources indicate that fewer than five customers have been lost even temporarily.

It has been learned authoritatively that, in making announcement of the price increase, the company refrained from revealing an ace in the hole in the belief that the buying public might misconstrue its meaning and use. It seems that Kaiser Co. Inc. had inquiries and definite orders from the South, Midwest and East for its rolled products in sufficient quantities to maintain capacity operations even if its western buyers withdrew completely. Even after the price increase averaging \$30 a ton was announced offers to buy from potential customers outside of its normal trading area continued to come

in. Demand for plates and butt-welded pipe were said to be particularly heavy and price was of minor importance.

It is believed that this information was withheld at the time the price rise was announced because many western buyers may have construed such a statement as a threat.

It has been pointed out that the original estimate of the net return to the Kaiser Co. Inc. which would be developed through this \$30 a ton increase as reported in THE IRON AGE (Aug. 19, 1948 p. 108) was too high.

It was originally estimated that this net would approximate \$17 million per year but when allowance is made for an approximate 40 pct tax return the net would be more nearly \$10 million.

Even taking this lower figure and assuming, as was stated, that this "extra" return would be applied to reduce the RFC loan to the point where Kaiser Co. would be in a more favorable competitive position, it is estimated that only approximately 3 years would be required to achieve this goal.

While buyers of Kaiser steel continue to writhe under, these increased prices and many of them say they would quickly shift to other sources of supply if they were available, some privately admit that had they been in the position of Henry J. Kaiser they would quite likely have taken some similar step to protect their interest and enable them to become competitive in the next few years.

In answering accusations by irate customers to the effect that Kaiser Co. was "gouging" in this seller's market to increase "profits" officials have been quick to point out that while the balance sheet indicates earnings, all such earnings have gone toward paying off indebtedness and no dividends have been paid to anyone and that Mr. Kaiser himself has received no salary or other remuneration as president of the company.

OPERATIONS at the Fontana plant continue at near capacity even though the blast furnace

is still down and will not be producing hot metal for at least another month. By that time it is expected that the first ore from Eagle Mountain Mine will be available.

There has been some conjecture as to the delivered cost of this new ore to the blast furnace and estimates have been unofficially made ranging from as low as \$2.50 to as high as \$3.50 per gross ton. The company, of course, owns the ore body and has a 52-mile haul on its own railroad and a 112-mile haul on the Southern Pacific R.R. from Ferum to the blast furnace. The Southern Pacific haul costs \$1.22 per gross ton plus a 3 pct tax. It is estimated that the cost of the 52-mile haul on the company's private railroad will be something less than 50¢ per gross ton and that the cost of the ore mined will be from 80¢ to \$1.50 per gross ton. If these figures are anywhere near accurate they indicate a reasonable cost for a high grade ore at the blast furnace and should contribute materially to the production of low cost iron. It is understood that ore from the Vulcan mine, which is 178 miles from the blast furnace, has been delivered at a cost higher than the above estimates. This ore has been of increasingly lower quality.

* * *

In the area around Fontana a mild "gold fever" is developing as a result of discoveries made by Willoughby J. Robinson. Mr. Robinson claims to have found traces of platinum, silver, selenium, tellurium, copper, iridium, palladium, ruthenium, rhodium and osmium in addition to gold. Mr. Robinson claims to have turned down an offer of \$175,000 for his property and \$16,000 in equipment which he has set up for placer mining.

In this small operation he is using a 74 ft long ripple bar into which the dirt is dumped after having passed through a crusher. Gold is recovered on mercury-coated copper plate.

Fred B. Grusel, San Bernardino county assayer and chemist is being kept busy making checks on samples brought in by those bitten with the mining bug.

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There's a Macwhyte Sling that's the right
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No other braided sling has this
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1. ATLAS Slings are braided from right
lay and left lay *endless* ropes.
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This Macwhyte ATLAS Special Choker sling is
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ANOTHER type of "gold mine" is the dream and hope of John Edwin Hogg of Alhambra, Calif. and Charles E. Goetz of Tolleson, Ariz. These men hope to solve the water shortage which is believed by many to be the limiting factor for population and agricultural and industrial development.

Mr. Goetz, an industrialist, and Mr. Hogg, a former Navy officer and writer, are looking for a few acres of land located on a 50 ft high cliff overlooking the sea where they hope to use a high efficiency diesel-powered, thermo-compression evaporator to produce 7500 gal of pure water daily from raw sea water.

These developers claim that they can produce water for industry or agricultural use at a cost only a little higher than that charged by many public utilities.

Water, or the lack of it, continues to be a serious consideration in the state and the emergency daylight saving time, adopted as one means of reducing the usage of stored water for the development of hydroelectric power, has been extended and will remain in effect after Sept. 26 when other states using this time system abandon it.

In extending the life of the daylight saving time edict, Governor Earl Warren said, "We have not

kept up with our power needs in view of the enormous growth of our state and we must not only have enough power to serve existing industries but to encourage other industries to establish themselves in California we require more power."

EFFECT of the waterfront strike on the coast which began Sept. 1 and tied up approximately 120 ships of which 40 were at local docks and idled 12,000 dock workers and 16,000 seafarers, was far-reaching but expected to be of short duration. Since practically all shipments of finished steel between the east and west are being made by rail the strike had but little impact on the industry. However, considerable quantities of scrap moving by water were tied up.

Scrap remains tight throughout the West and in Seattle where eastern interests have been making raids. Appreciable tonnages of No. 1 heavy melting were moving at \$30 per ton although the largest quantities continued to be sold to local consumers at \$27.50 per ton.

Portland, Ore. shipbreakers have been supplying Bethlehem Pacific Coast Steel Corp. with approximately 1000 tons per week. Consolidated Builders of Portland still

has a backlog of ships to be broken up and much of that material is moving south to California.

In the San Francisco area there are still an estimated 50 to 60 ships of various kinds—mostly LST's—to be scrapped. The Learner Co. of Alameda, has approximately 30 LST's to be broken up between now and the first of the year.

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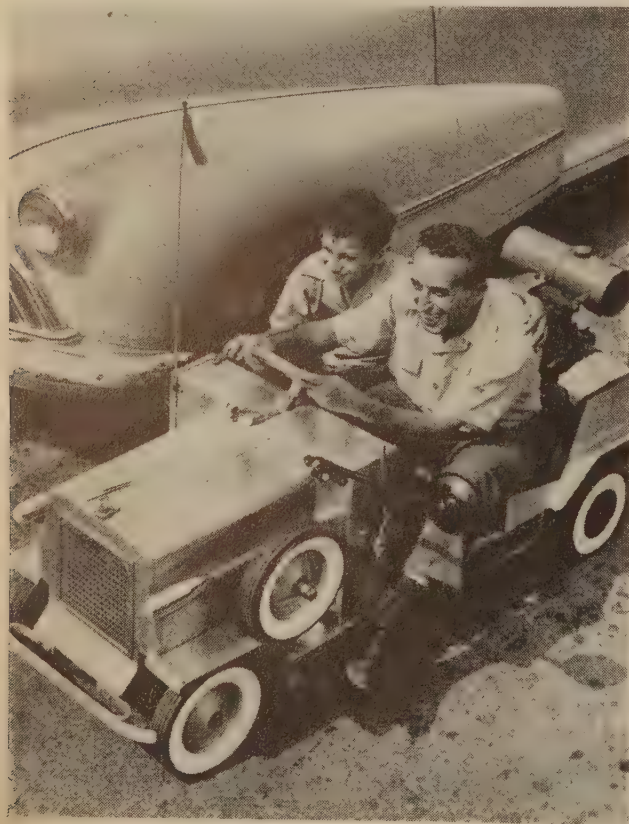
SALT LAKE CITY — Geneva Steel Co. has sold the town of Dragerton, lock, stock and barrel, to John W. Galbreath of Columbus, Ohio for resale to individuals.

The town, with more than 700 homes and well equipped with community facilities, was purchased by Geneva Steel from the government for \$1,553,000 as a means of providing housing facilities for its coal miners. The steel company obligated itself to dispose of the homes at reasonable prices and transfer the public facilities to the community when it was incorporated, and Galbreath, in purchasing the property, is obligated to carry out this program.

The sale price was not disclosed but Geneva will take a substantial loss on the transaction it is understood. The homes will be put up for sale to individuals at prices ranging from \$3100 to \$7000. The top figure will be placed on the 120 new houses constructed by Geneva since the purchase from the government.

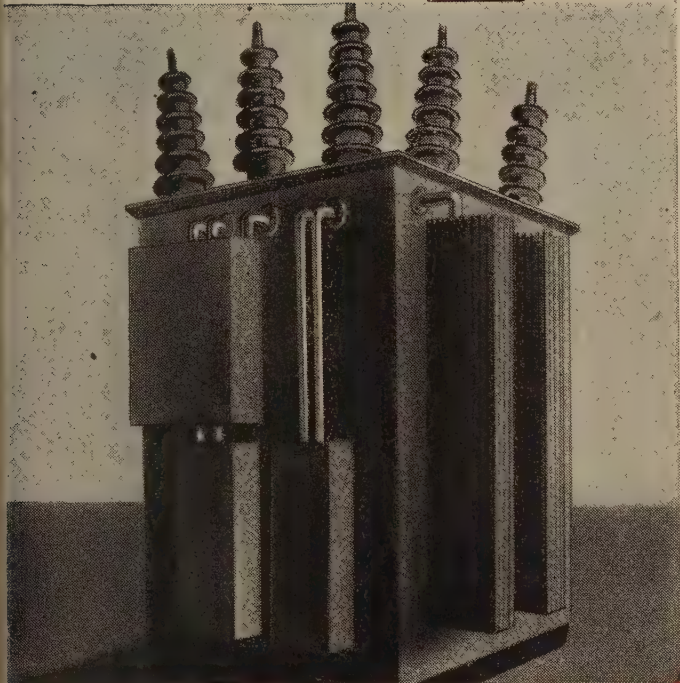
Dr. Walther Mathesius, Geneva's president, said the homes were being priced well below the cost of comparable housing facilities anywhere else in the country.

Incidentally the 120 new houses have never been occupied since their completion several months ago because of a controversy with the United Mine Workers of America over oil versus coal heating systems. The company installed oil heating equipment after a canvass of prospective tenants showed an overwhelming preference for oil. Union leaders issued an edict that the heating systems had to be replaced by coal burning equipment, which would have involved an expense of several hundred dollars on each home for construction of chimneys. The miners' wives issued a counter edict that the automatic oil equipment was to stay. It has stayed in most of the older occupied homes, with the new ones being left in a stalemate.



• • •
MERRY SCOOT-MOBILE:
Father and son go for a spin in their scooter-mobile. But pop built midget model in his spare time at a cost of \$265. Pop says he gets about 60 miles per gal at speeds of 20 to 25 mph. The car is 75 in. long, weighs 250 lb and is powered by a 4-hp, 1-cylinder engine.
• • •

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Every operation in the production and rolling of FOLLANSBEE ELECTRICAL SHEETS is rigidly controlled to assure uniform electrical, mechanical, and physical characteristics.

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The FOLLANSBEE representative nearest you can furnish complete information on FOLLANSBEE ELECTRICAL SHEETS as well as the other FOLLANSBEE SPECIALTY STEELS:

- COLD ROLLED STRIP
- POLISHED BLUE SHEETS
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U R G E N T : S T E E L N E E D S S C R A P — K E E P I T M O V I N G

PERSONALS

o o o



M. A. FOLLANSBEE, executive vice-president, Follansbee Steel Corp.

• **M. A. Follansbee** has been elected executive vice-president, Follansbee Steel Corp., Pittsburgh. He joined the Corporation in 1913 and served as district sales manager in the Chicago area for 20 years. In 1937 Mr. Follansbee was made general manager of sales. In 1940 he was elected a director and in 1941, vice-president in charge of sales, a position he will continue to hold in addition to his new responsibilities.

• **Charles B. Cleevely** has been named assistant superintendent of maintenance of the Campbell Works, Youngstown Sheet & Tube Co., succeeding **August C. Jacob** who has retired. Mr. Cleevely joined the company in 1904 as a mail boy. He served in the engineering department and later became a draftsman, assistant foreman and foreman of crane repairs, which latter position he held until his recent appointment.

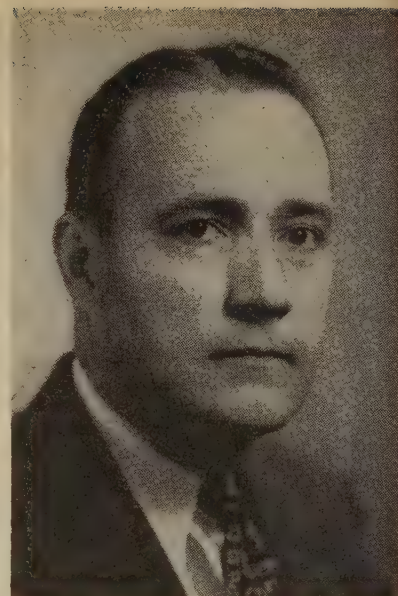
• **Thomas G. Harvey** has been appointed metallurgical engineer for the foundry division, Sonith Industries, Inc., Indianapolis. Mr. Harvey was formerly chief metallurgist for the Monarch Steel Co.

• **Joseph A. Teece** has been elected vice-president of Fansteel Metallurgical Corp., North Chicago, Ill. Mr. Teece joined Fansteel in 1924 as assistant purchasing agent. He later became purchasing agent and was made assistant to the president in 1939.

• **J. C. Madson** has retired as general superintendent, Benson Mines, Jones & Laughlin Ore Co., Star Lake, N. Y. Mr. Madson has been with the J&L Corp. since 1913, having been connected with Inter-State Iron Co. in Minnesota before taking charge of the Benson Mines operation in 1942. **William R. Webb**, assistant general superintendent of Benson Mines, has been appointed to succeed Mr. Madson as general superintendent. Mr. Webb came to Benson Mines from Blair Limestone Div., a subsidiary at Martinsburg, W. Va., where he was production superintendent. **J. C. Peterson**, chief clerk at Benson Mines has been transferred to Inter-State Iron Co., Virginia, Minn. Mr. Peterson worked for the Inter-State Iron Co. from 1929 to 1942, when he was transferred to Benson. **Wallace J. Fisher** of the General Accounting Department, Pittsburgh, has been named to succeed Mr. Peterson as chief clerk at Benson. Mr. Fisher started with J&L in 1928. **Carl Djuvik** has been appointed resident engineer at Benson Mines. He has been employed in the General Engineering department, Pittsburgh.

• **James I. Minter** has been named secretary of Stewart-Warner Corp., Chicago. Mr. Minter has been assistant secretary and assistant treasurer since 1943 and his appointment filled the vacancy created by the death of **A. R. Benson**.

• **Lee A. Kelly** has been appointed district sales manager of the Northwestern division of the American Radiator & Standard Sanitary Corp., Pittsburgh. **Daniel J. Keefe**, formerly manager of the company's Buffalo sales office, succeeds Mr. Kelly as manager of the New York sales office. **Daniel J. Quinn** has been appointed assistant general manager of sales. All three men have been associated with American-Standard and its predecessor companies for many years in various sales capacities. **C. W. Hewlett**, American-Standard's representative in Syracuse, has been named to succeed Mr. Keefe as manager of the Buffalo sales office.



GILBERT B. RICHARDS, general sales manager, Firth Sterling Steel & Carbide Corp.

• **Gilbert B. Richards** has been appointed general sales manager of Firth Sterling Steel & Carbide Corp., McKeesport, Pa., coordinating the sales of the steel, carbide and toolmaking divisions of the company. Mr. Richards was formerly associated with Bostitch, Inc. and Firestone Tire & Rubber Co.

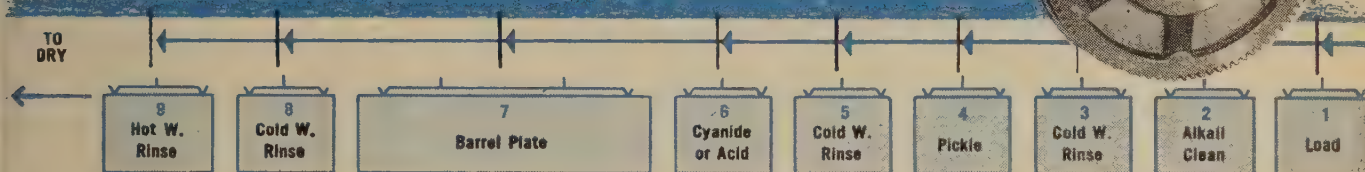
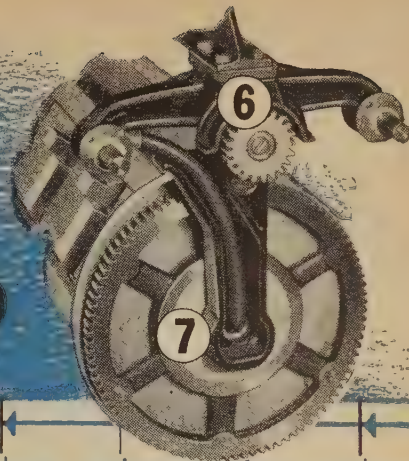
• **R. S. Reynolds, Jr.**, has been elected president of the Reynolds Metals Co., Louisville. **M. M. Caskie**, a vice-president and director of the company has been appointed executive vice-president and **Kenneth Mann**, a steel expert and formerly executive vice-president of Truscon Steel Co., has been employed as a manufacturing vice-president. **Calvin Coghill**, assistant treasurer, has been nominated to succeed R. S. Reynolds, Jr., as treasurer.

• **Louis Wozar** has been named assistant to the president and to the general manager of the Dayton Pump & Mfg. Co., Dayton. Mr. Wozar has formerly been associated with United Aircraft Products Inc.

• **John K. Corley** has been elected president and **C. J. Sharp** and **J. E. Ott**, vice-presidents of Acme Steel Co. of Canada. Mr. Corley, who has formerly been vice-president, has represented Acme Steel Co. of Chicago in Canada for 32 years.

(CONTINUED ON PAGE 153)

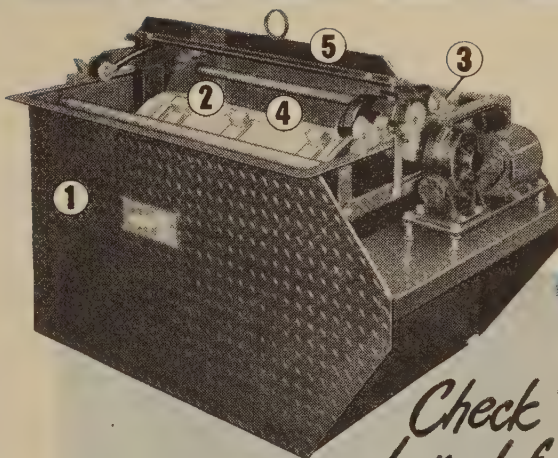
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it's Built to TAKE IT!

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• Russians overwhelmingly strong in Berlin but weak in Germany as a whole . . . Allies have advantage in struggle for German allegiance . . . Eastern sector looks to West for democratic self-government.



LONDON — The Four Power struggle for Germany has become, temporarily at least, less sharp. After weeks of negotiation in Moscow, agreement has been reached upon a possible procedure for ending the blockade of Berlin and agreed instructions have been sent to the four Commanders-in-Chief in Berlin, requiring them to work out a formula whereby, under Four Power control, the Soviet mark could become Berlin's currency.

The negotiations in Berlin will be involved and may not be conclusive. The Russians wish to raise the question not only of the issue of currency but of the control of credit and it will tax the Western Powers' ingenuity to the utmost to discover methods of making their control effective and of preventing discrimination against the Western Sectors of Berlin. The Russians are probably in no hurry to conclude an agreement since each day's delay brings them nearer to the completion of harvesting in the Eastern zone while to the Allies it only brings the threat of November weather to the airlift. Agreement may be reached in Berlin, but it may be followed by weeks of further negotiation in Moscow.

The basic fact of the German situation is that the Powers

are locked in a struggle to secure the allegiance of the German people. As this contest has developed, it has become increasingly clear that in Germany as a whole, the Western Allies hold all the cards. Quite apart from such issues as the Oder-Neisse frontier and the expulsion of the Germans from the Eastern lands, conditions in the Soviet zone have made nonsense of any Russian claim to be friend and liberator. Politically, the imposition of Communist rule has proved so unpopular that this year the Russians dare not risk elections, even faked elections. Economically, the systematic stripping of the Soviet zone has led to an acute food shortage and to a lack of consumer goods that no propaganda can cover. Even if the Western Allies had done nothing to improve conditions in their zones, they could hardly have failed to profit by the contrast with Soviet policy.

In fact, they are doing a certain amount to rebuild the West. The economic situation in western Germany is precarious and unstable enough, but American credits are coming in; Germany's participation in the Marshall Plan has begun; above all, the currency reform has brought back elements of normality to lift the nightmare of Ger-

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man existence. Politically, there can now be no doubt that in spite of their hesitations, the Germans welcome the offer of self-government. During their deliberations on the Allied proposals for a German government in the West, which began at Coblenz in July and were carried on at a later conference at Chiemsee, they have continued to stress the provisional character of any statutes they may approve and to insist again and again that no final step can be taken except by a reunited Germany.

They have, it appears, been strongly influenced in their decision to accept responsibility by the intervention of the democratic

leaders from Berlin. Dr. Reuther, in particular, has impressed on them that eastern Germany looks to them to establish a strong, democratic and self-governing community in the Western Zones as a rallying point for Eastern hopes. Western Germany can be the Piedmont of a united Germany provided that the Western Government speaks for Germany as a whole. It is in this spirit that the West German leaders have assembled at Bonn this week to accept, with their own emendations, the Allied proposals for self-government and to initiate the process which will lead first to the drafting of a constitutional document for Western Germany and then to the election of a government by popular vote.

This is the general picture, one of steady Allied advance and of steady Russian falling away. There is, however, one exception to it and that is Berlin. Weak in Germany as a whole, in Berlin the Russians remain overwhelmingly strong and the pattern of the struggle for Germany thus resembles a wrestling match in which one wrestler has almost got his opponent to the floor but is handicapped by the agonizing grip the man has on his right elbow. Everything that has happened since the blockade was imposed has underlined the strength of Russia's local position. Outside the Western Sectors, Soviet and Communist control is being imposed. The police force has been taken over. Food distribution is in Communist hands and it is now no longer possible for the freely elected city government to meet in the Stadthaus since it suffers organized invasion by Communist crowds.

THE German people have certainly shown opposition to the Russians. Sixty pct of the police in the Soviet Sector moved into the western sectors and only a tiny proportion of families sought to re-register in the Soviet Sector to secure some of the extra food offered as a bribe. But the blockade limits the capacity of the western sectors to live as a self-contained unit.

HALF

pH control

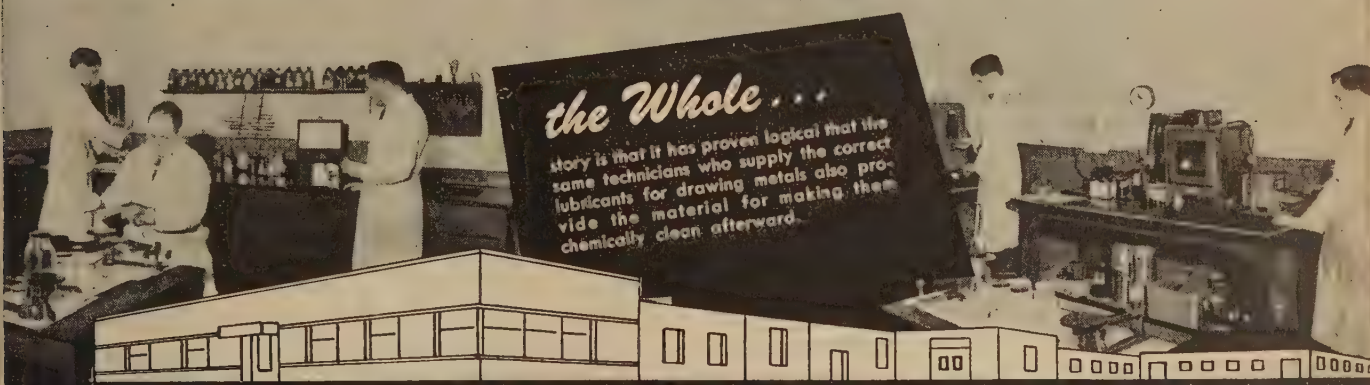
the other

HALF

SUPER-DRAW

Half of this message has to do with NORTHWEST products and processes for chemically cleaning ferrous and non-ferrous metals preparatory to plating, vitreous enameling, painting, etc., each problem involving a specific programming of one or more of the thirty-five standard NORTHWEST Cleaning Compounds including Electrolytic, Immersion, Solvent, Spray, and Water Wash types . . . the "Lo-Hi" pH process of chemically cleaning metals, preparatory to plating, porcelain enameling, etc., makes practical a control that management can plan on in these departments regardless of the type of metal or soil . . .

is concerned with metal forming lubricants developed for ferrous and non-ferrous metals in both pigmented and non-pigmented form . . . SUPERDRAW products are specifically compounded for: 1. Brass and Brass Alloys, 2. Cold Rolled Steel, Enameling Iron, Stainless Steel and Aluminum, 3. Alloys of Steel, Aluminum and Copper . . . SUPERDRAW compounds will handle light, medium, and heavy operations . . . may be applied by brush, roller, spray, or dipping . . . A request on your letterhead will bring a technician to consult you on your drawing and cleaning problems . . .



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'32

Industrial News Summary...

- **More Steel Seen by Next Year**
- **Production Aids To Be Cause**
- **Allocations Still Expanding**

MORE steel capacity to come this and next year is not all new equipment. Blast furnaces and openhearth are part of the picture but not the main part. Barring strikes next year the increase in steel production due to refinements, such as use of oxygen, coal washing, increased use of sintered ore and other production techniques will be amazing. Output in 1949 may hit 94 million tons without much new basic equipment.

One steel company (U. S. Steel) at its Chicago plant expects to turn out a million more tons than it did this year with the same equipment. Coal washing is the major contributing factor in this sure-fire goal. Other companies have been doing similar stunts to increase steel output. That is why next year's total steel output will go farther in cutting down the cried-for steel than at any time in the past 3 years.

Steel demand is expected to be strong even by late next year. But by that time it is almost certain that many who are not getting what they want now will no longer be in the gray market or deep in conversion plans. The only hedge is the possibility of war. In that case butter would give way to armament. There is no single piece of evidence today that the steel industry would fail to meet all the requirements which would be placed on it in event of war.

In addition to plans already under way for steel expansion, firms are continuously having sample or exploratory plans made up. Often these lead to rumors of large-scale expansions that just aren't yet fact—and may not become so for years, if at all. One reason why some steel officials are stymied on the future location of new plants or equipment is the question mark on future ore and coal supplies.

NEW sources of ore have been found, and are being exploited by major steel firms. Searches are going on continually. On the basis of known facts Canada and South America will play an important part in the steel economy of the United States in years to come.

The basing point dislocations alone will cause grief in mapping out where new steel capacity shall be located in the years ahead. But the answer to this will not be too long in coming. Until then some plans for blast furnaces and openhearth must wait. And until then steelmakers will continue to cut corners with what they have. At the same time they will force output up to the maximum level possible, which is the same as adding new capacity—only less expensive. If the f.o.b. mill system of selling steel remains intact, a large Eastern steel mill is a certainty. All that re-

mains is to start turning over the dirt—but that decision may be a few more years in coming.

Steel users, egged on by the success of some groups in getting voluntary allocation, are almost causing a "run on the bank." If those charged with control of this plan cannot successfully withstand the intense pressure from congressmen, associations, groups and individual companies, the plan may be doomed. Voluntary allocations are supposed to take care of essential needs that vitally affect the economy of the country and that of the Economic Cooperation Administration.

This week steel customers acted like human beings. They were saying "me too." Even companies which have been "well heeled" on steel requirements are getting jittery. "Just to make sure," some of them are putting in their oars. This is no more than can be expected. They remember vividly the priority system in early days of the war. Those who waited too long then were out in the cold until the controlled materials plan came along. That was government allocations, not voluntary.

SO far the job done by Office of Industrial Cooperation and steel company advisers has been miraculous in the face of pressure. The men who handle these allocations know enough about steel firms to see that commitments are fulfilled. If the program gets out of hand, as it now threatens, no one will benefit. The result in that case would play into the hands of those who want to put the steel industry into a distribution straitjacket.

These are mild problems compared to those which will slam steel firms when they get the Small Business Steel Subcommittee questionnaire next week. The information to be supplied must include data on shipments to every state in the union and also to special areas. Briefly, with the exception of naming actual customers, this committee is demanding (with subpoena held over head) practically all the information each of 20 steel companies has in its files on sales of major steel products.

What the committee will do with the material is not known. It will be months before it is compiled. Eventually some government bureau or committee will have in its hands the most potent data on steel distribution and shipments ever to be packaged by the industry for the U. S. Government.

Steel output this week is unchanged at 95 pct. At the present rate it is likely that the industry will turn out as much as 87 or 88 million tons of steel ingots this year.

• **STAINLESS HUBBUB**—Elimination of warehouse discounts, coincident with some recent stainless steel price increases, has caused what steel sales executives call unwarranted excitement. They have eliminated the discount—which amounted to 10 pct at the most—and put stainless on the same basis as carbon steels. Discounts were originally introduced to help push stainless as a new product. With the discount, warehouses were able to sell on a mill basis and in some cases undercut mill prices.

• **MAKING IT STICK**—WAA has given final approval to the Kaiser-Frazer Corp. lease on stack No. 5 in Cleveland which has been operated by Republic Steel Corp. Only remaining legal hurdle is the expected Justice Dept. opinion that the lease does not violate any antitrust laws. Henry J. Kaiser lost no time in exercising his option on the disputed blast furnace—a move he had promised two weeks ago.

• **BUYERS' MARKET**—Fractional hp electric motors are in such good supply that items used for their manufacture are easing up. The laminations industry is strictly competitive. Magnet wire—a very short item a year ago—is being sold at a good discount by large makers today.

• **JUICING UP**—Republic Steel Corp. will electrify its Youngstown Bessemer plant as a part of its program for modernizing district operations. When all equipment has been installed, the steam boiler plant will be abandoned. This will eventually result in lower costs and provide more efficient operations.

• **BRANCHING OUT**—The Atomic Energy Commission has assumed administrative responsibilities for the metallurgical research services of the Battelle Memorial Institute, Columbus, Ohio. Thus the Office of Chicago Directed Operations of the AEC has added another laboratory to its list within the last 18 months, among which has been Argonne National Lab., Ames, Ia. Others are Illinois Institute of Technology, University of Wisconsin, Westinghouse Electric Corp., UCLA and numerous consultant contracts in scientific fields.

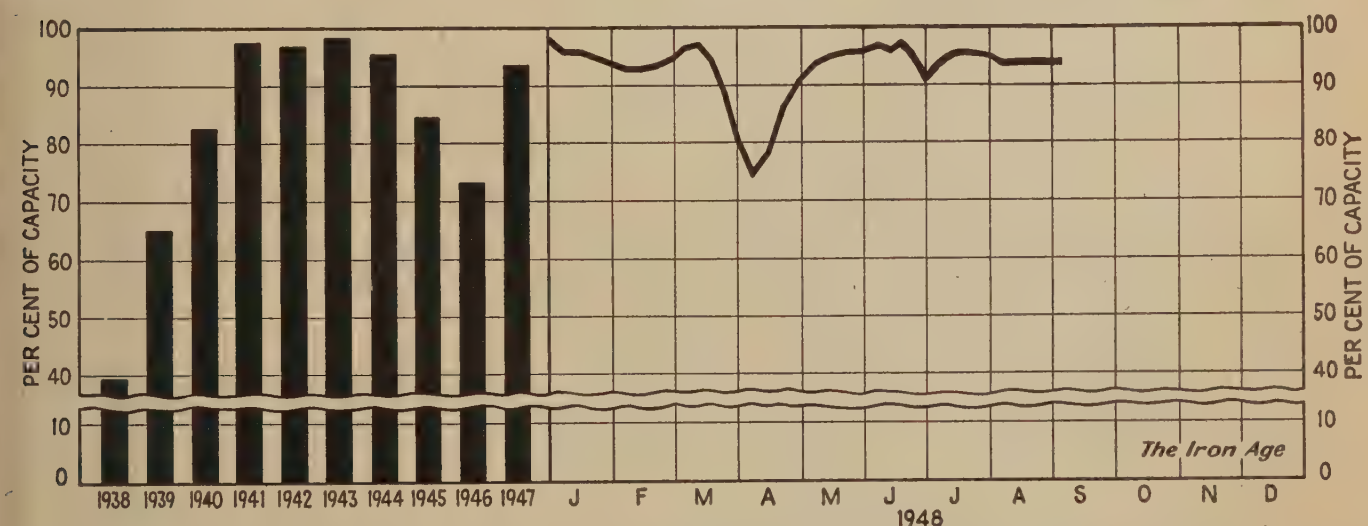
• **BETTER THAN '47**—Finished steel shipments for the first 7 months of 1948 are 1.3 million tons higher than for the corresponding period of 1947, according to the American Iron and Steel Institute. Cold rolled sheet shipments were up 3,868,500 tons or 23 pct higher than the previous year. Pipe and tubing, currently another of the tight items, rose 11.1 pct which is the equivalent of 3,846,800 tons. Substantial increase in 7-month shipments were also made in tin plate, steel plate and semifinished products. Total shipments for steel products for July were 5,229,880 tons—an increase of 5.1 per cent over July of 1947.

• **GOING IN HOCK**—Stockholders of the Lukens Steel Co. held a meeting and said that the company could go ahead and do it—borrow \$4 million from the Penn Mutual Life Insurance Co. at 3½ pct interest, repayable within 10 years. The company has had no bonded indebtedness since it paid off the first mortgage and deed of trust of \$5.5 million to Bankers Trust Co. The loan will be used to pay off present short term bank loans and to provide working capital.

• **REYNOLDS CONNECTS**—U. S. Steel Supply Co., a subsidiary of the U. S. Steel Corp., has made plans with the Reynolds Aluminum Co. to stock and sell a complete line of aluminum products. Thus Reynolds gets the break of having a national distributing outlet. U. S. Steel Supply can now more completely service metal users. Distribution of the new products will be held in abeyance until Reynolds can completely stock all sizes of the items U. S. Steel Supply has agreed to handle.

• **MORE SCRAP**—About 300,000 metric tons of unassorted iron and steel scrap will soon be made available for export sale, according to SCAP Foreign Trade New York Office. About 50 pct of this scrap is owned by agencies of the Japanese Government and the balance by private individuals. Scrap owned by Japanese governmental agencies will be sold by the Japanese Board of Trade on a sealed bid basis. That held by private interests will be sold through private buyer-seller negotiations under usual procedures. These contracts will be approved by the Board of Trade and validated by SCAP.

Steel Ingot Production by Districts and Per Cent of Capacity



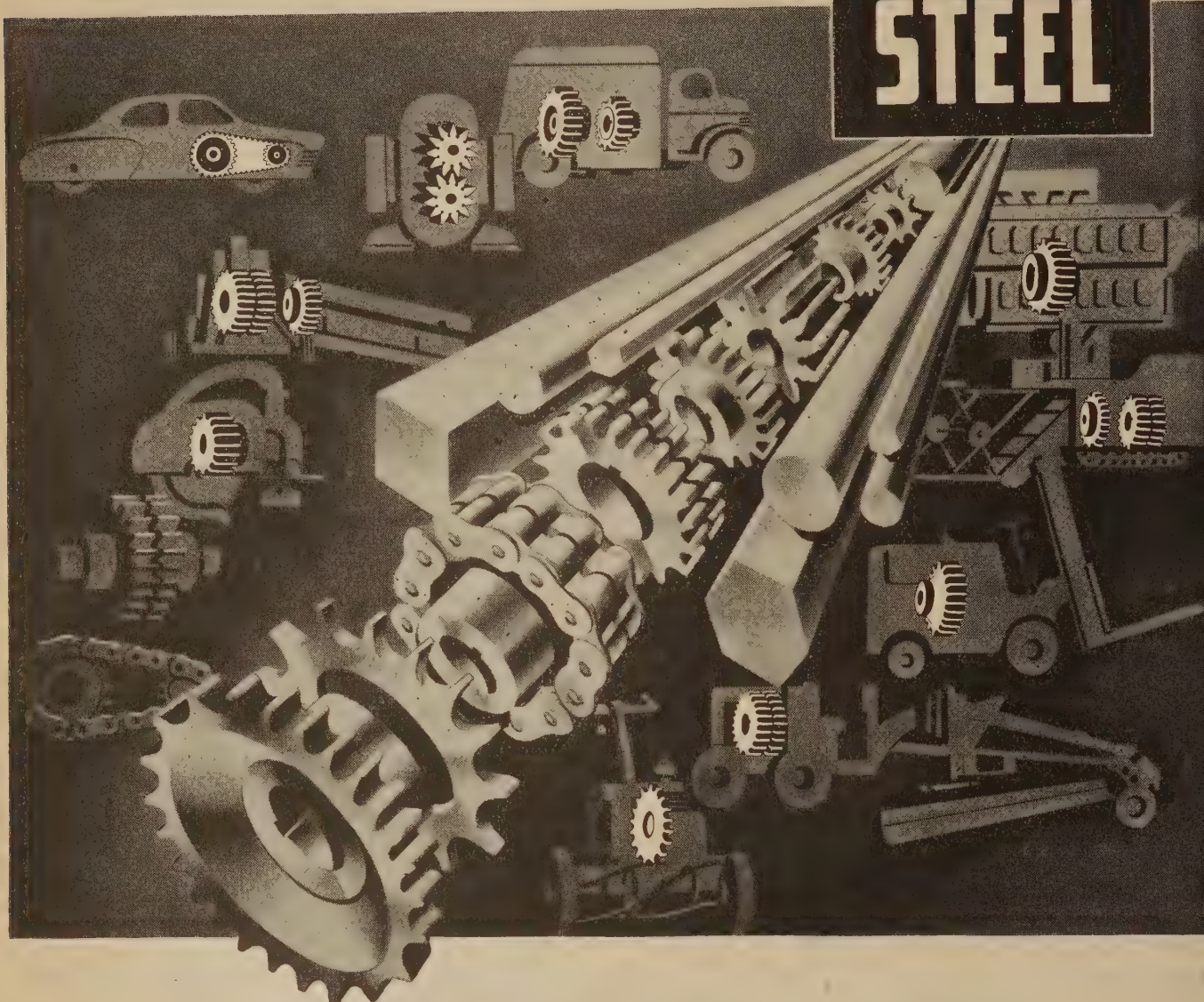
Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Sept. 7.....	96.0*	94.5	91.0	87.0	94.0*	107.5*	101.0*	99.0	101.0*	91.5	103.0	85.0	102.0	95.0
Sept. 14.....	97.0	94.5	91.0	87.0	94.0	105.0	101.0	102.0	102.0	91.5	103.0	91.6	102.0	95.0**

* Revised.

** Tentative.

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Link-Belt men like J&L Jalcase steel because it machines freely at high speeds, is easy to heat treat and the parts have a fine finish. They get more pieces per hour because Jalcase is uniform.

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- Less down-time
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Title _____
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JONES & LAUGHLIN STEEL CORPORATION

Nonferrous Metals Supplies Tight In Face of Persistent Demand

New York

• • • Three years after the end of the war, consumers of nonferrous metals find themselves unable to obtain the full tonnages they require. But few consumers recognize that present metal consumption rates have seldom been reached or exceeded during peacetime.

The current rates of metal consumption are admitted by producers to be based on record production schedules for industrial and consumer products. They say the short supply of nonferrous metals will continue as long as the present high level of industrial activity is maintained.

However, there are some indications that the shortage of copper is easing somewhat, despite stockpiling needs. This does not indicate that producers will be unable to sell their entire production for the balance of the year and perhaps longer. Some small tonnage copper consumers say that it has not been difficult recently to obtain all the metal they need. But the wire and brass mills, whose order backlogs have all but disappeared, are still producing in heavy volume and would take more copper if available.

The higher price of copper has already had its effect in some restriction of demand. Producers say that small lot customers are conspicuously absent from current requests. Brass mill order volume has begun to show the effects of higher mill products prices. They say that the flood of orders taken just before their wage increases has cut down current business sharply. Nevertheless, they are still on a partial third shift operation, and are heavy consumers of primary copper and zinc, largely due to the drying up of war originated brass mill scrap. Sheets and tubing still constitute the heaviest volume products of the mills. Competitive marketing has begun among the wire mills, as indicated by some recent downward price readjustments.

Although the price of copper is still well below its World War I

Copper Eases, But Stockpiling, Strikes Aggravate Lead And Zinc Markets

By JOHN ANTHONY
Eastern Regional Editor

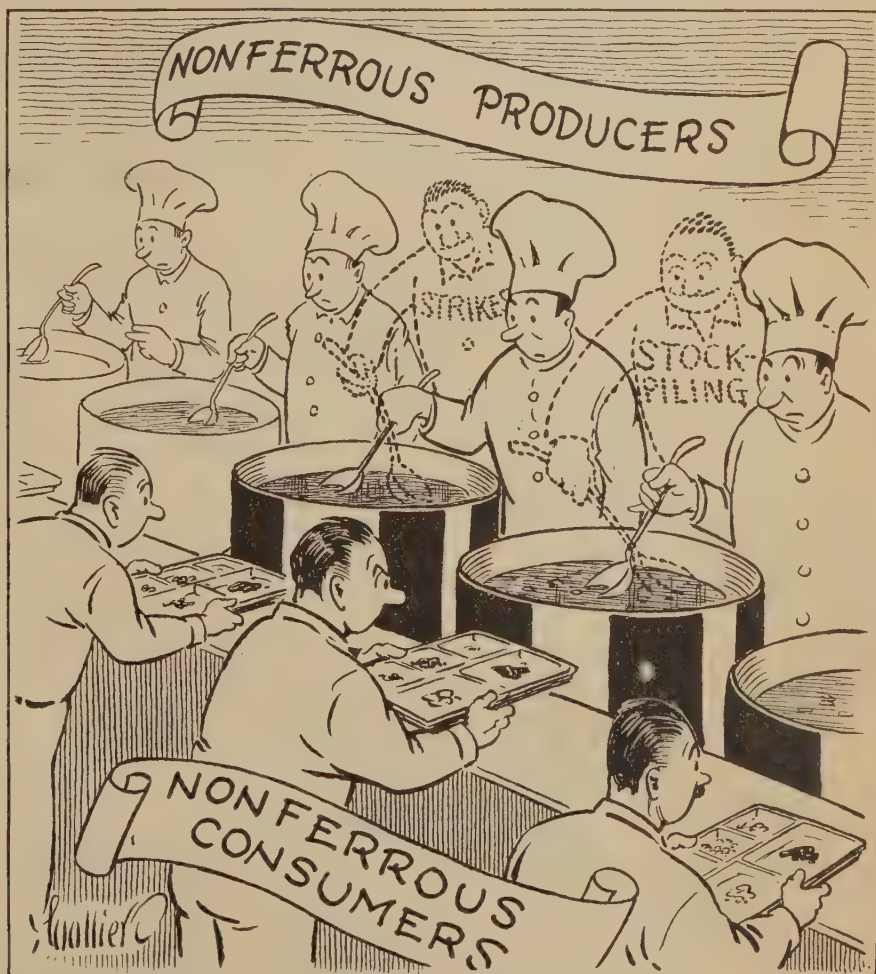
high of 37¢ per lb, a higher price than the current 23.50¢ is not possible for some time unless it becomes necessary to grant new wage increases next year. It is understood that major producers will not raise their price even should independent action be ini-

tiated by smaller producers. The foreign copper market is relatively inactive at this time, thereby relieving pressure on price from this source.

The lead and zinc markets are in a much more critical short supply position at this time, with serious strikes still in progress at the St. Joseph Lead Co. properties in Missouri and at the American Zinc, Lead & Smelting Co. plants at Ft. Smith, Ark., at East St. Louis and Hillsboro, Ill. There is no approaching agreement in either of these strikes due to the failure of the officials of the Mine, Mill & Smelter Workers Union to sign a non-Communist affidavit.

The Eagle Picher Mining & Smelting Co. strike in the Tri-

Tighten Your Belt!!!



Industrial Briefs . . .

• **BUYS TUBE COMPANY**—Crucible Steel Co. of America, New York, has announced that an agreement has been reached for the acquisition of Trent Tube Mfg. Co. at East Troy, Wis., as a wholly-owned subsidiary. The Trent company will continue under the present management, headed by Walter H. Wiewel of East Troy, president and head of operations.

• **BRANCH OFFICE**—The Hanover Steel Corp., New York, subsidiary of Solar Steel Corp., a steel warehouse servicing customers in the eastern territory has announced the opening of its Philadelphia office in the Beury Bldg.

• **LEASES MILL**—The Permanente Metals Corp. has announced completion of preliminary negotiations with War Assets Administration to lease the Newark, Ohio, aluminum rod and bar mill. Immediate steps will be taken to place the \$23 million plant covering approximately 1 million sq ft in operating condition. The contract with WAA provides for a 10-year lease of the facility with an option to renew or extend for an additional 15-year period.

• **CHANGE OF NAME**—The Indianapolis Brass & Aluminum Foundry, Inc., Indianapolis, has changed its name to Sonith Industries, Inc. They have also made announcement of entering into a contract with Meehanite Metal Corp., New Rochelle, N. Y., to produce Meehanite castings in their foundry.

• **MORE MACHINERY**—Goodman Mfg. Co., Chicago, is expanding two of its buildings to permit faster assembly of the coal mining machinery and other heavy machinery they make. The company is making a two story top addition to its office building and a one story expansion in its machinery assembly building.

• **TO HEAD GROUP**—Ralph Hochman, president of Ralph Hochman & Co., Newark, an affiliate of the Hochman Machinery Co., Philadelphia, has been elected president of the Machinery Dealers National Assn. He succeeds George B. McClennen of Philadelphia, now a member of the board.

• **WESTERN PLANT**—The U. S. Pipe & Foundry Co., Burlington, N. J., has purchased a 35 acre tract of land located in the San Francisco Bay area at Richmond, Calif., for the purpose of erecting a plant for the production of cast iron pressure pipe made by the centrifugal process.

• **TO REPRESENT**—Chemical Pump & Equipment Corp., 75 West St., New York, has been appointed to represent the Process Equipment Dept. of Union Iron Works, Erie, Pa., covering all of New York east of Rochester and western Connecticut. Union Iron Works manufactures heat exchangers, autoclaves, fractioning columns and special chemical processing equipment.

• **ADDS TO PLANT**—Available Truck Co. of Chicago is currently making an addition to its plant of about 50,000 sq ft of floor area. This company makes trucks, truck tractors, crane carrier chassis, fire truck chassis, bus and heavy duty automotive equipment.

• **OPEN HOUSE**—The Steel Co. of Canada will hold open house at its Hamilton Works on Oct. 5 and 6. The company's management and employees are making preparations to play host to 30,000 people on the 2 days.

• **ACQUISITION**—Pettibone Muliken Corp., Chicago, has purchased the assets and business of Universal Engineering Corp., Cedar Rapids, Iowa, manufacturers of crushing machinery and allied equipment for rock and gravel plants.

State area has been settled at an estimated loss of 18,000 tons of zinc concentrates and 2000 tons of lead during a 9-week period. It is estimated that the St. Joseph Lead strike has caused a loss of 20,000 tons of metal during its 2-month period. The American Zinc strike is now a month old, Illinois workers having gone out on Aug. 13 and Arkansas workers on Aug. 21.

The smaller consumers of lead have been paying large premiums in order to obtain metal. Foreign lead is being bought in good tonnages at 23½¢ a lb and transactions at higher prices have been reported.

Major consumers have had to curtail their production due to the shortage. They are unable to go into the market for premium lead, as that would immediately bring about an increase in the domestic price. Under these circumstances, the prospect of stockpiling at a rate that might well exceed 5000 tons a month is not viewed happily by producers or consumers.

More lead and concentrates are now being brought in from Mexico in order to try to relieve the shortage. However, a higher domestic lead price might well grow out of Mexican imports. The Mexican Government recently devalued the peso, making it worth in dollars only half its previous value. At the same time it instituted a 15 pct ad valorem export tax. Metal interests are now attempting to determine whether this tax is applicable to exports of ores and concentrates. In any event, the devaluation is expected to result in demands for higher wages by the miners, despite wage control by the government, because the Mexican economy is largely dependent on imports from the United States.

There is no doubt in the trade that there must be a rise in domestic prices following such a development, particularly if it is established that the 15 pct tax is payable on ores and concentrates. In addition, as the payment of domestic premiums grows to larger proportions, with continuing scarcity, there must be a read-

(CONTINUED ON PAGE 126)

Lake Iron Corp. Obtains Share of Iron from Buffalo Furnace

Cleveland

• • • As smoke from the Kaiser-Frazer-Republic Steel Corp. battle for the government-owned blast furnace here was still clearing away, Lake Iron Corp., a recently formed group of Detroit businessmen, entered into an agreement this week with Wickwire Spencer Div. of Colorado Fuel & Iron Corp., to transport and supply iron ore, coke and limestone for C.F.&I.'s "X" furnace at Buffalo, in return for half the pig iron output of the furnace.

Under terms of the agreement, Lake Iron Corp. will receive about 7000 tons of pig iron a month, with the balance being retained by C.F.&I.

THE IRON AGE learned of the agreement, which runs for 3 years, as erroneous rumors of the sale of "X" furnaces were traveling through the trade.

A. F. Franz, vice-president in charge of operations, Wickwire Spencer Div. at Buffalo, admitted that an agreement had been concluded with Lake Iron Corp. for half the output of "X" furnace, but denied reports of a change in the operating agreement C.F.&I. has with Republic Steel Corp. for "Y" furnace.

"I understand there are a lot of rumors about our 'X' and 'Y' furnaces at Buffalo," he said. "Y" furnace is being operated by Republic Steel Corp.; Wickwire takes 8000 gross tons of iron per month from the output of this furnace. The balance of the output from this furnace goes to Republic.

"'X' furnace is still being operated by us, although Republic has a superintendent there to help with production. We are working very closely in the operation of these two furnaces in order to obtain maximum output.

"Lake Iron Corp. supplies ore and coke for the operation of 'X' furnace. In return for this, Lake Iron Corp. receives 7000 tons of iron per month, or about half the output from this furnace. The balance is retained by us."

Lake Iron Corp. was formed in Michigan, July 5, 1948. Troy H. Browning is president, Edwin L. Ecclestone is vice-president, and

Detroit Businessmen Supply Raw Materials For "X" Furnace Operation

By BILL LLOYD
Cleveland Regional Editor

Frank W. Donovan is secretary and treasurer. Lake Iron has headquarters at 639 Griswold Street, Detroit, in the Penobscot Building. The company was organized to deal in ores, pig iron, steel ingots and semi-finished steel products. Mr. Ecclestone is a partner in Grosse Point Motors, Detroit. Mr. Donovan is a lawyer.

Mr. Browning is president of T. H. Browning Steamship Co., Detroit, which has four vessels on charter from Nicholson Transit Co. These are former War Shipping Administration vessels, but Lake Iron Corp. is moving iron ore for "X" furnace from the Mesabi range in Canadian bottoms, it is understood. The chartered hulls carry coal up the lakes and sand on the return trip.

Republic Steel Corp. supplies the raw materials for "Y" furnace.

Some mystery surrounds Lake

Iron Corp.'s source of iron ore, in view of the general scramble for tonnage on the part of some steel producers. It was reported here that Butler Brothers were supplying the bulk of Lake Iron Corp.'s requirements, but this was denied by an official of Butler Brothers. Butler Brothers was recently purchased by a group of steel companies and M. A. Hanna Co. for a reported \$12 million.

It is understood that Hellier Coal and Coke Co., Kentucky, is supplying Lake Iron Corp. with the coke for the operation of "X" furnace. Limestone is coming from Calcite, Mich., where U. S. Steel Corp. has extensive limestone quarrying operations.

"X" furnace was blown in Aug. 23, after being down some months for repair. According to reports, the initial iron ore requirement was 300,000 tons, enough to carry "X" furnace well into May, 1949.

Lake Iron Corp. has already received some tonnage from "X" furnace, none of which has gone into Detroit. However, about 48 cars were shipped into Michigan last week, and it is understood that Lake Iron Corp. officials expect to reach 175 cars of pig iron a week in the near future, plus a certain amount of iron which will move by boat.

Coming Events

- Sept. 28-Oct. 1 Assn. of Iron & Steel Engineers, Convention and Iron and Steel Exposition, Cleveland.
- Oct. 4-7 American Institute of Steel Construction, annual convention, Quebec, Canada.
- Oct. 5-7 Industrial Packaging Engineers Assn., Industrial Packaging and Materials Handling Exposition, Chicago.
- Oct. 5-9 Concrete Reinforcing Steel Institute, semiannual meeting, Asheville, N. C.
- Oct. 11-13 National Lubricating Grease Institute, annual convention, Chicago.
- Oct. 11-13 American Society Tool Engineers, semiannual meeting, Los Angeles.
- Oct. 13-15 Porcelain Enamel Institute, annual forum, Urbana, Ill.
- Oct. 14-15 Gray Iron Founders' Society, annual meeting, Atlantic City.
- Oct. 18-20 National Metal Trades Assn., annual convention, New York.
- Oct. 18-22 National Safety Congress and Exposition, Chicago.
- Oct. 22-25 Metal Treating Institute, annual meeting, Philadelphia.
- Oct. 23-29 American Society for Metals, annual convention, Philadelphia.
- Oct. 24-29 American Welding Society, annual meeting, Philadelphia.
- Oct. 25-27 American Institute of Mining and Metallurgical Engineers, Metals Div., fall meeting, Philadelphia.
- Oct. 25-27 American Gear Manufacturers Assn., fall meeting, Chicago.
- Oct. 25-29 National Metal Exposition, Philadelphia.
- Oct. 27-28 Society for Nondestructive Testing, annual convention, Philadelphia.

Construction Steel . . .

• • • Fabricated steel awards this week included the following:

- 360 Tons, Philadelphia, St. Martin's Roman Catholic Church, to Bethlehem Steel Co., Bethlehem.
- 290 Tons, Waynesboro, Va., acetate building for E. I. duPont de Nemours Co., to Ingalls Iron Works Co., Birmingham, Ala.
- 135 Tons, Easton, Pa., LaFayette College dormitory, to Bethlehem Steel Co., Bethlehem.
- 100 Tons, Quincy, Mass., Sacred Heart Church, through Walsh Bros., Cambridge, Mass., to A. O. Wilson Structural Steel Co., Cambridge.

• • • Fabricated steel inquiries this week included the following:

- 900 Tons, New Hampshire, 13 bridges from Massachusetts line at Seabrook, N. H., to Maine line at Portsmouth, N. H., new highway.
- 565 Tons, Phoenix, Salt River bridge and approaches, South Central Ave., Arizona State Highway Commission, Phoenix, bids to Sept. 21.
- 300 Tons, Fitchburg, Mass., nurses home.
- 200 Tons, Weston, Mass., new high school.

• • • Reinforcing bar awards this week included the following:

- 360 Tons, Chicago, building for Horder, Inc., to George Sollit, contractor.
- 300 Tons, Medford, Mass., B. & M. Realty Co. building, through Vappi & Co., Inc., Cambridge, to Truscon Steel Co., South Boston, Mass.
- 225 Tons, Tulare, Calif., highway construction and 5 bridges between, one mile south of Tipton and Tulare Airport, through N. M. Ball Sons, to Gilmore Fabricators, Inc.

150 Tons, Normal, Ill., special education building for Illinois Normal College, through John Felmsley Co. to Bethlehem Steel Co., Inc., Bethlehem.

• • • Reinforcing bar inquiries this week included the following:

- 3000 Tons, Chicago negro housing project, through Chicago Housing Authority, S. N. Neison Son, low bidder.
- 550 Tons, Cook Co., Illinois Northwest intercepting sewer, Paschen Contractors, Chicago, low bidder.
- 435 Tons, Phoenix, Salt River bridge and approaches, South Central Ave., Arizona State Highway Commission, Phoenix, bids to Sept. 21.
- 360 Tons, Hinsdale, Ill., township school, A. L. Jackson Co., low bidder.
- 175 Tons, Livermore, Calif., undercrossing and bridge, Calif. Div. of Highways, Sacramento, bids to Sept. 29.
- 125 Tons, Los Angeles Co., Calif., widen two bridges between Malibu Creek and Las Flores Creek, Calif. Div. of Highways, Los Angeles, bids to Sept. 30.

• • • Railroad car awards and inquiries this week included the following:

The Santa Fe Railroad has ordered from Pressed Steel Car Co., Pittsburgh, 50 65½-ft., 70-ton gondolas. The Norfolk & Western Railroad has ordered 10 steel cabooses from the St. Louis Car Co., St. Louis. Wabash Railroad will build in their Decatur, Ill., shop 600 50-ton box cars. Delaware & Hudson Railroad has ordered from Greenville Steel Car Co., Greenville, Pa., 100 70-ton covered hopper cars. They have also ordered 20 air dump cars from Magor Car Corp., New York. The Union Pacific Railroad is ready to place orders for their 1949 rail requirements. This rail requirement totals 105,350 net tons.

manufacturers have already abandoned the basing point system in its entirety without reservation. But some have retained that method while others have gone over to f.o.b. selling and reserve the right to absorb freight in some cases to meet competition.

Warehouses are becoming alarmed by what f.o.b. selling holds in store for them in the future when the present seller's market disappears and markets return to normality. Then districts overloaded with warehouses will not provide a market for the available steel—thus causing serious distribution problems.

The confusion in pricing methods in the bolt and nut industry in particular has taken place during the last month. During that same period prices have been increased from 12 to 18 pct. This is all in addition to nonuniformity in pricing methods.

Under the basing point system, there were only 5 basing points in this industry; Pittsburgh, Chicago, Cleveland, Birmingham and the Pacific Coast. This made price computations relatively simple when compared with the present practice of quoting prices and computing rates to a multitude of different consuming points.

Timken Views Pittsburgh As Possible Plant Site

Pittsburgh

• • • The industrial relocation inquiry boom continues here with unabated vigor. Latest to investigate possibilities of obtaining plant space is Timken-Detroit Axle Co. They seek a plant suitable for the production of stampings and forgings.

Both economy and military security figure in Timken's plan to shift a part of their Detroit operations here, according to Col. Willard F. Rockwell, chairman of the board.

From an economy standpoint, a Timken plant in this area would be more economical because the freight charges from the steel mill to the plant would be less than from the mill to its Detroit facilities. It would also save shipping the scrap from its operations back to the steel mills.

Mr. Rockwell also pointed out that a contemplated shift to this area would be partly at the request

of military authorities which have listed the hilly region as one of the safer industrial areas in the event of an atomic bomb attack.

Although no suitable plant is at present available, Timken has not given up. They are not interested in any other area. And it is improbable that they will build themselves because of the high construction costs that prevail currently.

As a result, the situation has resolved itself into one of hoping and waiting — with no second choice acceptable.

F.O.B. Selling Disrupts Bolt and Nut Industry

Washington

• • • Disruptions in marketing techniques will continue as a result of f.o.b. mill selling unless Congress legalizes the basing point system of selling, according to leaders in industry.

Here are some of the confusions that are causing a hubbub in marketing circles: Many bolt and nut

Named Chief of Iron And Steel Branch Of Industry Div. of ECA

Washington

• • • Langdon S. Simons, 52, former secretary-manager of the Steel Export Assn. of America, has been named chief of the Iron and Steel Branch in the Industry Div. of Economic Cooperation Administration.

Mr. Simons is on temporary leave from his position as secretary-treasurer of the Optical Manufacturers Assn., a position he has held since 1946. He served as executive assistant to the chief of the War Production Board's steel division in 1942 and 1943 and later served with WPB's export steel branch.

He was program director for the China-America Council of Commerce and Industry in 1944 and 1945 and served with the Steel Export Assn. of America from 1939 to 1942. From 1926 to 1939 he was associated with Norton Co., abrasives manufacturers.

Steel Producers Facing Comprehensive Inquiry on Distribution

Washington

• • • The nation's 20 largest steel producers next week will be on the receiving end of the most comprehensive quiz on steel distribution ever before set up by a Congressional investigating committee.

Senator Martin, R., Pa., chairman of the steel subcommittee of the Senate Small Business Committee, is now putting the finishing touches on a bulky 3-part questionnaire which is scheduled to be in the hands of a score of the principal producers within the next few days.

"I think we need this type of information, and I see no reason why we should not get it," Senator Martin declared. In a form letter mailed out with each copy of the questionnaire, Mr. Martin asks each producer to complete the quiz forms and return them to the Senate subcommittee within 30 days. And, if the completed forms are not filled out and returned within the required 30 days, the subcommittee may use its subpoena power to obtain the requested information.

The first part of the quiz—Chart 1—asks for net tonnages shipped in 1940 and 1947 of selected carbon steel products to certain geographic areas. The areas named are the 48 states plus 6 "special" areas—New York City, Philadelphia, Cleveland, Detroit, Chicago, and Canton-Massillon-Mansfield.

The "selected carbon steel products" are sheet (hot and cold-rolled), strip (hot and cold-rolled), bars (hot-rolled and cold-finished), pipe (butt and lapweld), and tubing (seamless, electric weld, mechanical and pressure). The tonnages to be given by each firm are to show all shipments within the continental United States, but excluding those to other members of the industry for conversion and shipments to affiliated and independent warehouses.

The second part of the questionnaire—Chart 2—asks net tonnages shipped in 1940 and 1947 of all of the above products plus structural shapes and plates to affiliated steel-consuming companies. "Steel-consuming companies" means firms either wholly or partially owned

Quiz Will Provide Most Potent Distribution Data Ever In Hands of Government

By GEORGE H. BAKER
Washington Bureau

companies. A loophole is provided the companies in protecting their production data by this note: "Omit warehouses and omit other steel companies to which shipments were made only for the purpose of further conversion or resale."

The third part—Chart 3—of the questionnaire asks net tonnages shipped in 1940 and 1947 of all of the products named in Chart 2 plus drawn wire, wire nails, staples, barbed wire, twisted wire, woven wire fencing, and bale ties to affiliated warehouses and other jobbers, dealers and distributors. The committee asks for the names of the affiliated warehouses involved, and gives its definition of "affiliated warehouses" as those either wholly or partially owned. In addition, Chart 3 asks for the total shipments to "all other warehouses."

Each chart, when completely filled out by the steel companies, is to be authenticated and certified by

a responsible official of the steel firm involved.

Pretests made by committee investigators in offices of the Carnegie-Illinois Steel Corp. and the Bethlehem Steel Corp. indicate that all the information asked for in the questionnaire is readily available, the committee feels. (THE IRON AGE, Aug. 26, 1948, p. 123.)

Just what use the Senate Small Business Committee will make of the information it hopes to obtain via its questionnaire is anybody's guess.

It is certainly true that the committee will have to spend weeks—possibly months—in tabulating and evaluating the returns. And it is also true that the committee is due to expire at the end of 1948 and its chances of rebirth as a "special committee"—which it now is—are slim.

But Senator Wherry, R., Neb., chairman of the full committee, knows a good thing when he sees it. The committee's line of activity may therefore turn up under a new label next year. It may have the voice of Jacob, but the hand will be that of Esau. And in Esau's hand will be some of the most potent data on steel distribution and shipments ever to be packaged by the industry for the U. S. Government.

TRANSFER BUGGY: This 135-ton electric transfer car simplifies handling coils of strip steel up to 15 tons. It is battery powered and contains a motor generator charging unit that converts 220 v 3-phase 60 cycle current to the proper volt-ampere relationship required to charge the battery.



Develops New Method Of Inspection by Magnetism

Chicago

••• **Magnaflux Corp.** has perfected a new method of magnetizing parts. This method permits parts to be inspected for defects in any direction with one magnetizing operation and one visual inspection. This system, called "Duovec," comprises the application of two magnetizing forces simultaneously. The parts are placed between the heads of the unit where they receive magnetization in both directions during one shot.

In the MV unit, a current is passed through the part as in the normal circular magnetization. At the same time the part is subjected to a longitudinal field of regularly changing strengths. The resultant varying force swings through an angle within the piece by more

than 90° and thus cuts across all possible defects of right angles.

In these units the swing of the field may be adjusted from 0° to well over 90°, by changing the relation of values between the circular and longitudinal magnetizing fields. This type of magnetization can be used with the fluorescent Magnaglo particles as well as the usual wet Magnaflux visible particles to obtain indications of defects in the parts.

Dedicate Laboratory To Pioneer in X-Ray Work

Milwaukee

••• As a permanent tribute to Dr. William D. Coolidge, 75-year-old X-ray pioneer and Director Emeritus of the G-E Research Laboratory, Schenectady, the largest X-ray development laboratory in the world was dedicated here by the General Electric X-Ray Corp. on

Monday, Sept. 13.

The ceremonies for the dedication of the Coolidge Laboratory took place at the site, and were witnessed by more than 500 distinguished visitors.

The new laboratory represents the culmination of an expansion program launched more than 2 years ago in an effort to keep pace with the mounting demand for new X-ray applications in medicine and industry. Dr. Coolidge has been responsible for many important developments in the electrical field.

In 1908 he developed ductile tungsten which made possible the incandescent electric light bulb. His second major contribution to X-ray was the "hot cathode." His third development was the "cascade" principle, which paved the way for higher voltages and X-ray tubes, making possible the 1 million and 2 million v^t tubes in common use today.

AMERICAN IRON AND STEEL INSTITUTE SHIPMENTS OF STEEL PRODUCTS ALL GRADES INCLUDING ALLOY AND STAINLESS (Net Tons)

JULY - 1948
Month

Steel Products	Number of companies	Items	Current Month		To Date This Year		Whole Year 1947	
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale)	Per cent of Total Shipments
			(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)	(Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	44	1	281,379	5.4	213,388	4.8	1,822,549	4.7
Structural shapes (heavy)	12	2	354,467	6.8	1,260	6.5	15,421	7.0
Steel piling	4	3	24,276	0.5	688	0.5	1,083	0.5
Plates (sheared and universal)	29	4	564,624	10.8	26,285	10.5	220,113	10.1
Skelp	6	5	9,727	0.2	30,693	0.2	236,441	0.3
Rails—Standard (over 60 lbs.)	4	6	152,855	2.9	1,271	3.0	7,227	3.5
—All other	5	7	14,578	0.3	135	0.4	843	0.3
Joint bars	7	8	9,342	0.2	2,364	0.2	22,852	0.3
Tie plates	7	9	39,444	0.7	9	0.8	270	0.8
Track spikes	8	10	10,129	0.2	210	0.2	349	0.3
Hot Rolled Bars—Carbon	34	11	477,053	9.1	38,317	9.5	354,559	9.9
—Reinforcing—New billet	16	12	113,317	2.2	177	2.1	3,986	2.0
—Rolled	13	13	19,834	0.4	—	0.3	—	0.3
—Alloy	27	14	140,439	2.7	15,825	2.9	133,390	2.8
—TOTAL	44	15	750,643	14.4	54,319	14.8	491,935	15.0
Cold Finished Bars—Carbon	28	16	93,957	1.8	741	2.0	3,468	2.3
—Alloy	26	17	16,298	0.3	990	0.3	3,953	0.3
—TOTAL	35	18	110,255	2.1	1,731	2.3	7,421	2.6
Tool steel bars	18	19	6,330	0.1	189	0.1	1,108	0.1
Pipe & Tubes—Butt weld	15	20	161,693	3.1	3,043	3.0	15,195	3.0
—Lap weld	8	21	26,988	0.5	—	0.5	3	0.6
—Electric weld	13	22	130,021	2.5	405	2.3	2,964	2.0
—Seamless	17	23	225,351	4.3	14,098	4.4	99,315	4.1
Wire rods	20	24	40,837	0.8	21,943	1.0	177,897	1.1
Wire—Drawn	39	25	171,750	3.3	11,660	4.1	102,407	4.1
—Nails and staples	17	26	61,459	1.2	600	1.3	7,777	1.3
—Barbed and twisted	15	27	16,581	0.3	21	0.4	94	0.4
—Woven wire fence	13	28	26,906	0.5	334	0.6	2,139	0.6
—Bale ties	11	29	9,005	0.2	—	0.2	—	0.2
Black Plate—Ordinary	9	30	69,403	1.3	—	1.3	654	1.3
—Chemically treated	2	31	1,087	—	—	—	—	—
Tin and Terne Plate—Hot dipped	8	32	187,484	3.6	27	3.2	194	3.3
—Electrolytic	9	33	149,179	2.8	—	2.7	215	2.6
Sheets—Hot rolled	32	34	621,544	11.9	47,159	11.9	372,515	12.5
—Cold rolled	16	35	583,417	11.1	1,574	10.3	7,891,798	8.7
—Galvanized	15	36	127,890	2.4	159	2.5	5,504,578	2.5
Strip—Hot rolled	23	37	128,873	2.5	31,468	2.5	1,709	2.5
—Cold rolled	34	38	120,895	2.3	2,088	2.7	202,610	2.7
Wheels (car, rolled steel)	5	39	25,357	0.5	37	0.5	14,030	0.6
Axles	5	40	16,111	0.3	—	0.3	658	0.3
All other	—	41	—	—	—	—	97	0.3
TOTAL STEEL PRODUCTS	140	42	5,229,880	100.0	467,158	100.0	3,839,472	100.0

During 1947 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

Cries of "Monopoly" Periling Single Private Scrap Corporation

Washington

• • • Approximately 1 million tons of German scrap could be made available to American industry within 6 months after the establishment of a private corporation to buy all German scrap, according to Alex Miller, Dept. of Commerce scrap expert, provided the German railroads hold up and the rivers and canals do not freeze over.

Nevertheless, the practical aspects of such a corporation, which would end much of the confusion now surrounding scrap buying in Germany, may be overruled by the legalities of the situation. In fact, the Office of Industry Cooperation's plan to establish such a corporation ran into several serious snags last week.

While a majority of the approximately 300 members of the scrap dealers present at an exploratory meeting with the Dept. of Commerce indicated they would support such a corporation, a number of dealers, primarily those who have been dealing in German scrap, violently opposed the plan and threatened legal action on monopolistic grounds.

The corporation envisaged by the Commerce Dept., according to Mr. Miller, would be financed and staffed by the scrap industry and would be open to all members of the industry. It would buy German scrap at prices fixed by the Bi-Partite Board (which is headed by General Clay for the United States and General Robertson for the United Kingdom), ship the scrap to the United States where it would be distributed on the basis of allocations made by the Office of Industry Cooperation. The corporation would not operate on a non-profit basis, but would receive a reasonable commission for its efforts.

The other fly in the ointment is in the Antitrust Div. of the Justice Dept., where this half-fish half-fowl experiment in government-industry relations is being looked at rather closely. In an offhand opinion, Commerce officials say that any private scrap dealer who did not become a member of the corporation would not be able to buy

Majority of Dealers Favor Plan; 1 Million Tons Seen in 6 Months

• • •

By EUGENE J. HARDY
Washington Editor

• • •

scrap in Germany. This aspect of the program will be studied carefully by the Justice Dept.

Informally, Justice Dept. has told Commerce to go ahead with developing the plan but has not guaranteed approval and will not make a formal ruling until a concrete plan has been worked out by the Scrap Industry Advisory Committee. While the idea is backed by government, the formal plan must be presented by the scrap industry in order to bring the plan under the voluntary allocations act.

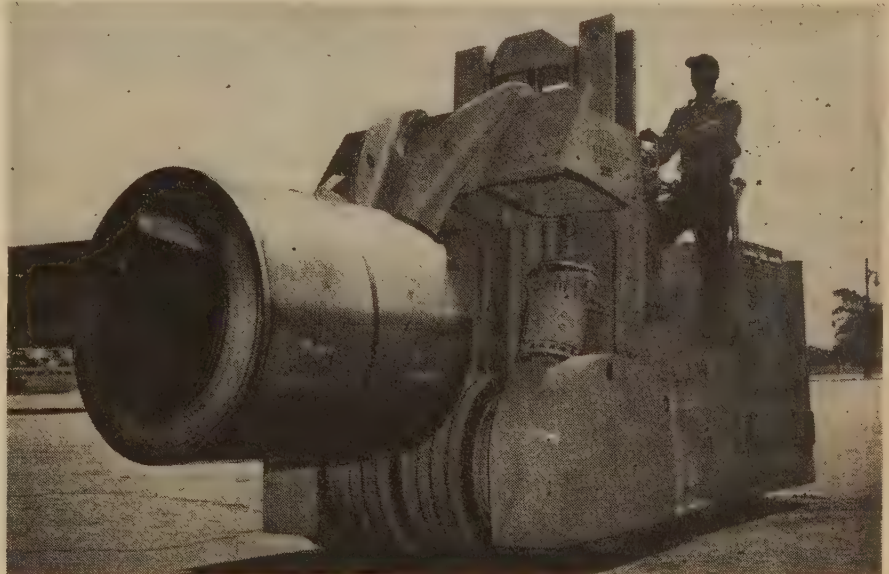
Another angle of the plan which may cause trouble is the fact that the Office of Industry Cooperation will be allocating a commodity purchased by a private corporation. As presently planned, OIC will publicize the quantities of scrap available, steel mills and foundries will ask for portions of the scrap, OIC

will ask for information as to relative need, and finally OIC will allocate the scrap to the mills and foundries showing the greatest immediate need. The price to American buyers of scrap landed on the east coast would be comparable to present day market quotations, according to OIC.

In the meantime, plans are going ahead for an industry-wide scrap drive to increase the supply until the scrap flow from abroad begins. The drive got underway with a meeting held here with Commerce and other officials, including ECA Administrator Paul Hoffman and Munitions Board Chairman Thomas Hargrave.

Trade association executives representing scrap producing industries unanimously approved the project. It was the general opinion of those present that considerable scrap can still be dredged from unused or obsolete industrial equipment, from auto wrecking yards and from farms. Farm scrap will receive first attention because of the seasonal factors. A scrap drive committee is being set up by Commerce Secretary Sawyer, who is studying the list of available persons. Personnel of the committee selected will be announced at a later date.

SKYLIFT GIANT: This large coil lifter is taking over a lot of the work formerly done by cranes in the Ford River Rouge plant. It is designed to handle up to 20,000 lb of coiled steel. This lifter comes right in line with more modern and faster materials handling in the automotive industry as well as other industries.



Lebanon Steel Foundry Acquires License For Casting Super Alloys

Lebanon, Pa.

• • • The Lebanon Steel Foundry here has acquired licenses from the Firth-Vickers Stainless Steels, Ltd. of Sheffield, England, for making super alloy castings by the British firm's process, according to William H. Worrirow, president of Lebanon.

Mr. Worrirow added that the castings would be made available immediately for the production of turbojet engine components in the \$500 million U. S. military aircraft engine program.

The process, Mr. Worrirow said, makes possible the centrifugal casting of high temperature alloys. This method of manufacture provides a substantial saving in production costs since high temperature alloys are difficult and costly

to form.

Mr. Worrirow also said that the process is adaptable to marine and land installations and that it opens new avenues for the use of cylindrical parts of high temperature heat resistant metals required for further development of turbojet and turboprop engines.

Under terms of the agreement between Lebanon and Firth-Vickers, provision has also been made for the continued exchange of technical and manufacturing information in regard to corrosion and heat resistant steels and related processes as well as new steels now being developed by Firth-Vickers.

Sets Application Date

Washington

• • • Applications for authority to import tin-bearing alloys into the United States during the fourth quarter of this year must be on file by September 30, the

Dept. of Commerce has announced. The Department policy authorizing private import of these alloys was announced August 5.

Import license applications (Form ODC 1041) should be addressed to the Tin and Antimony Section, Non-Ferrous Metals and Minerals Division, Office of Domestic Commerce, Room 1431, Tempo T Building, Washington 25, D. C.

Nonferrous Supplies

(CONTINUED FROM PAGE 120)

justment of the domestic price structure.

The zinc shortage is not nearly so critical. The most recent figures of the American Zinc Institute show a decline in the tonnage of unfilled orders at the end of August to 60,357 tons. However, this figure is well above any month in 1947 and a large part of the war years. Any conclusion that zinc is now more plentiful is not borne out by the difficulty currently being experienced by brass mills, die casters and galvanizers in obtaining the grades they need.

The price of zinc can also be expected to react to the devaluation of the Mexican peso and to the imposition of an export tax on ores and concentrates. In addition, the export market is quoted at Gulf ports at $\frac{1}{2}\phi$ higher than the East St. Louis price. Further pressure in the world market would be sure to result in an early increase in domestic prices.

As yet an unknown quantity in the metal markets is the effects of the rearmament program and the European Recovery Program. The latter has already begun to draw off some metal from foreign sources of copper, lead and zinc. So far there has been no marked impact on the domestic market, but there is expected to be an accelerating inflationary effect as time passes.

The rearmament program has not yet begun to affect any non-ferrous metal except aluminum. Brass mills have not received any orders, phantom or otherwise, that can be identified with a rearmament program. It is believed that any important orders they receive would be confined to cases for new sizes or types of ammunition, as there are large government stocks of cases for established types of projectiles.

50 YEARS AGO

THE IRON AGE, September 15, 1898

• "It is common for hotels to have their own laundries, electric lighting plant, and bottling machinery but the Hotel Metropole in New York is probably the only one that does its own electroplating of tableware."

• "The Rae Motor Cycle Co. of Chicago have completed the first new horseless carriage and recently gave a successful public test of it. The motor is a patent $3\frac{1}{2}$ -hp unit. The vehicle is said to run 50 to 60 miles at one charge of the battery and to develop a speed of 15 mph."

• "Labor troubles are again becoming a feature of daily news. Under existing conditions they are to be regarded as one of the indications of improving trade. Workmen are either dissatisfied with the continuance of old rates of wages when they see evidences of a revival in business, or else they refuse to accept a

reduction because the impression prevails that times are better in every other line."

• "Aluminum wire will be used for the transmission line conveying power from Snoqualmie Falls to Seattle and Tacoma, Wash. Contracts have been made at prices cheaper than copper."

• "A German professor has announced the discovery of a material for use in the incandescent lamp which he claims does not need to be enclosed in the familiar pear-shaped vacuum tube."

• "English journals have made the extremely interesting discovery that for the first time exports from the United States for the fiscal year ending June 30, surpassed British exports. This is the first time in the records of trade that British exports have been surpassed by any nation."

Weekly Gallup Polls . . .

Public Holds Mixed View on Taft-Hartley Labor Act

Princeton, N. J.

••• One year after the passage of the Taft-Hartley law, American voters have widely divergent views about the measure, according to George Gallup, director, American Institute of Public Opinion.

Some want it made more strict in regulating labor unions, but these are counterbalanced by voters who want the act made less strict. Nearly one-third — the largest single group — think it should be left unchanged. About one voter in six wants to see the measure repealed outright.

The controversy over the celebrated labor regulation measure sharply divides the country along occupational lines. Among labor union members and manual workers there is considerable sentiment for either repealing the act or making it less strict, whereas among professional men and women and among farmers there is comparatively little sentiment for liberalizing the act or doing away with it.

All voters who said they had heard about the act—three out of every four—were asked:

"Do you think the Taft-Hartley law should be revised, repealed or left unchanged? If revised, should it be more strict with labor or less strict?"

The national vote follows:

Law should be:	Pct
More strict	12
Less strict	14
Repealed	16
Left unchanged	31
No opinion	27

The Taft-Hartley issue splits opinion along political lines. Among Democratic voters there is much more sentiment for repeal or softening of the act than among Republican voters. This raises the question whether Gov. Dewey can afford to advocate changes in the act during his campaign without offending the large body of Republican sentiment which is in favor of keeping the legislation as it is.

The division by political sentiment follows:

	Dems. Pct	Reps. Pct	Independents Pct
More strict	9	16	11
Less strict	16	9	19
Repeal	25	5	16
Left unchanged	22	42	28
No opinion	28	28	26

Union leaders in both the CIO and the AF of L have declared that a major part of their political effort this year will be devoted to trying to defeat Congressmen and Senators who voted for passage of the Taft-Hartley act.

The labor union vote follows:

LABOR UNION MEMBERS

	Pct
More strict	2
Less strict	21
Repeal	38
Left unchanged	21
No opinion	18

By occupation groups the vote is:

	Bus. & Prof. Pct	Farm Pct	Wh. Coll. Pct	Man. Work Pct
More strict	21	15	13	6
Less strict	14	6	18	13
Repeal	10	7	14	24
Left unchanged	32	31	33	29
No opinion	23	41	22	28

••• The West Central states, most Republican section of the country in the last two presidential elections, are today the least Republican section outside the South.

The farming states that make up the West Central section show a political pattern different from the rest of the country. Whereas nationally the Republicans are running much stronger today than they did in 1944, the West Central states form one section where Gov. Dewey stands about the same today as he did four years ago, when he ran against Mr. Roosevelt.

Farm prosperity and high prices for farm products undoubtedly have had an effect. Although the area was the first big region to show a marked defection from

Political Pattern Different Where High Prices Halt GOP Trend in Midwest Farm Areas

President Roosevelt, beginning as early as 1936, the defection slowed down markedly as farm prices improved. Gov. Dewey leads in the West Central section as a whole, the institute poll shows, but it is far from being one of his strongest sections.

Political sentiment in the West Central states follows:

WEST CENTRAL SECTION (As a Whole)

	Pct	Pct
Dewey	48	52
Truman	42	45
Wallace	3	3
Undecided	7	

The trend of sentiment in that section in recent elections follows:

	Dem. Pct	Rep. Pct
1936	61	39
1940	49	51
1944	48	52
*TODAY	45	52

*Not shown is the Wallace vote of 3 Pct.

It will be seen that although Gov. Dewey has not gained in his percentage of the total vote since 1944 in the section, the Democrats have lost 3 percentage points. This is because Henry A. Wallace draws virtually all his support in the section from former Democratic voters.

One significant thing about the Mid-West farm vote today is the contrast with the big city vote elsewhere in the country.

During the Roosevelt Administration a wide breach developed between the arm vote and the big city vote. Farmers outside the South swung sharply away from the Democratic party between 1936 and 1940 while the big cities, although they showed some shift, remained overwhelmingly Democratic.

Sales Show Some Gain But Builders Hold Gloomy View of Future

• • • Trade sources report a slight improvement in new firm order volume in some sectors, but with government stockpiling of strategic materials and a general shortage of materials, particularly steel, indications are that a number of major projects requiring machine tools may end up on the shelf for the time being. Saleswise, August was a better month than July, and September to date has shown improvement over the corresponding period of September, 1947, but, unfortunately, there are no figures which can be cited as proof.

In Chicago, midwest sellers and manufacturers report the spottiest business they have experienced in years. New Inquiry volume is very low. The only large program on which they are actually being asked to quote are tools for ECA.

There seem as yet to be very few aircraft programs of defense nature. Some of the sellers here believe that the Boeing plant in Wichita might prove to be good but there is a question of how much of that machinery will be supplied from JANMAT. Original requirements are being sent to Seattle for screening and will then be submitted to the Army for approval. Even though JANMAT might get the bulk of the actual tools, machine tool people in this area will still get some accessory business. So far the machine tool industry in this area reports that the rest of the armament program is still in the paper stage.

Those working on the requirements of machine tools for ECA are busy trying to get this program from a relief to a true recovery program. They report that foreign industry has very modern methods and are only backward in equipment. Foreign dealers in machine tools, these men say, are topflight men and are giving the American experts plenty of co-operation and are very anxious to get the program actually going.

Those close to the development overseas and the state of the ECA

Ray of Hope Seen in Industries Which Need Replacements To Maintain Output

• • •

program report that the actual requirements and orders will probably first come from Italy, Austria and the Scandinavian countries.

The Italian government is considering giving its own machine tool manufacturers the same financial backing and terms as they get from us. There are sellers and builders of machine tools in this country that are still leery of the ECA program because some of the tools will go to countries now in the shadow of the Iron Curtain. These companies remember and still have machines to show for it, what happened on the Russian program. They do not want to repeat their previous mistake of manufacturing machines and then not getting paid for them because international conditions, export licenses, currency exchange difficulties, suddenly cropped up.

Some makers declare they will treat foreign orders as follows: They want some money deposited in New York banks and released to them as soon as the machines are completed at the manufacturing plant. From there on the difficulties of actual exporting, they feel, should lie with the buyer.

There are a few industries in which the machine tool people see activity which will represent new business. One area is the Iron Range, Lake Superior area. With the new methods of ore beneficiation will come substantial markets for machine tools. Much of the machine tool equipment will be for maintenance and will be more or less standard tooling. The pool of tools in this area for the most part are old and antiquated and not capable of maintaining increased demand that will be put on them as the iron ore industry

starts to switch over to large beneficiation programs.

Another industry in which machine tools seem, to a limited extent, to have a bright future is in the railroad industry, builders report. The advent of the diesel engine and its wide acceptance has meant the railroads have had to buy newer and better equipment capable of precision work. As the replacement of steam engines by diesels is speeded up the need for this type of tools is bound to increase.

Some machine tool experts predict that a solid stand against JANMAT tools will be taken by many manufacturers who might receive defense orders. Some of the new aircraft programs, if ever fully under way, demand tools of higher precision and more horsepower than it is possible to get out of the older tools now in the JANMAT pool. So far the turbine blade and bucket jet program has not been satisfactorily solved as far as the machining operations are concerned.

The tolerances demanded on some of these parts are such that they can only be had by grinding and some tool builders report that rough machining tolerances in case approach plus or minus a quarter of a thousandth. This, the builders say, is a difficult, if not impossible, proposition on the types of alloys that are being used for these parts.

WAA Catalogs Remaining Surplus Plants for Sale

Washington

• • • Industrialists, businessmen and other persons interested in acquiring surplus, government-owned industrial plants from War Assets Administration should consult the new edition of the *Plant Finder* recently issued by WAA.

WAA says that this will be the final catalog to be published containing a directory of available surplus real properties suitable for manufacturing, warehousing and other commercial uses.

HOW MUCH PRESSURE IS PUT

on SCRAP-COLLECTIONS in your plant?

Scrap collections warrant determined action by top-level management, because output of virtually everything from adding machines to zephyr cloth is jeopardized by the continuing acute scrap shortage.

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Consult your local scrap dealer for advice on types, grades and sizes.

The amount of steel available depends upon the tonnage of scrap turned in. Everyone is affected by the scrap situation, and now is the time for each individual to get every available pound of scrap back to the mills.



MORE SCRAP—MORE STEEL
Move your scrap to the mills

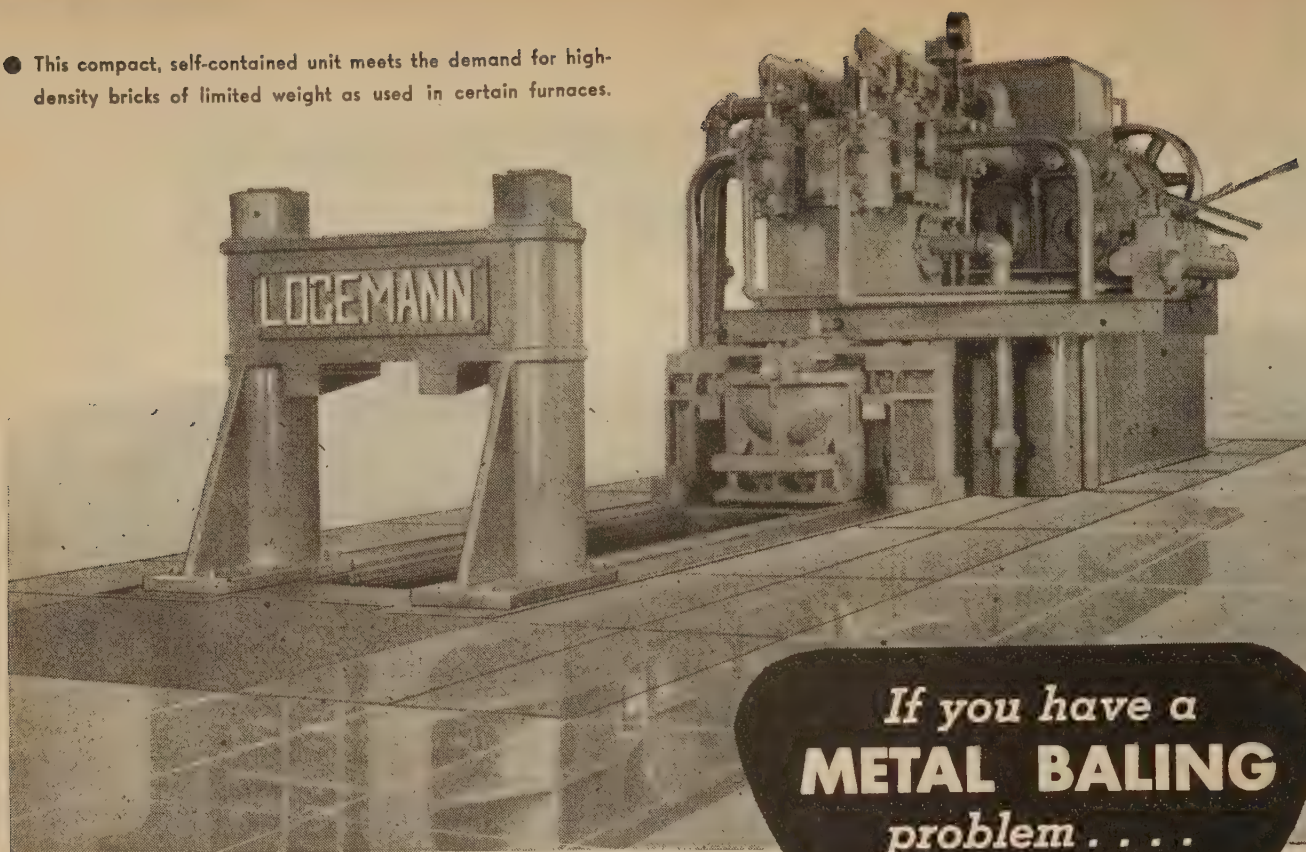
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Railroad Abandons Allocation Sales

New York

••• The market generally marked time this week except in Detroit where cast grades firmed considerably and in Boston where over-the-market selling warranted increasing the price spread for No. 1 heavy melting to \$37 to \$38.90 and No. 2 heavy melting, Nos. 1 and 2 bundles and bushelings to \$35.50 to \$36.

Decision of one of the major scrap producing railroads in Cleveland to cease selling on an allocated or earmarked basis not only established a precedent but also strengthened a market that had shown signs of weakness. This action follows in the footsteps of a recent ICC ruling which, in the railroad's interpretation, could leave it open to suit under the Robinson-Pitman Act.

By selling scrap on an earmarked or allocated basis this railroad feels that it would be liable for charges of collusion, unfair competition or unfair trade practices by selling to large consumers at lower prices and throwing the balance on the open market for bidding by marginal consumers.

Whatever the motive, to avoid legal entanglements or to obtain a larger return for the same tonnages, the move is expected to provide a stern test for existing prices on railroad grades in this area.

Rumors continue to circulate that many of the larger mills are making fair progress in their stockpiling efforts to build up a winter reserve. However, demand is still strong in all areas since the drive to build up these reserves is far from satisfactory. One major mill is reported to have almost 100,000 tons of winter reserve on hand now. This is estimated to be about one-half of its stockpile which with the normal supply would insure continuous operation during the winter.

Shipments are moving well at current prices in most areas. Everyone is still making an all-out effort to get all the scrap they can. Periodical halts of shipments results only from congested unloading conditions.

PITTSBURGH—Pricewise the market marked time during the past week. The only change was a \$1 increase in heavy breakable cast iron prices. Mill buyers are talking of price softness in openhearth steel. The bearish talk stems from the prospects of German scrap coming into this and Eastern markets. Since very little has arrived, it hasn't touched current prices. When or if the tonnage being talked of—even the realistic estimates not the fantastically hopeful guesses—arrives, as planned observers here believe, the effect on prices will be bearish. Scrap remains hard to get, particularly the electric furnace and foundry grades. Shipments are holding up and district mills are generally laying down fairly good tonnages.

CHICAGO—Last week the market remained quiet. Little or no activity was evident as far as price changes go on items for the mills. Railroad specialties however, slid off \$1 to \$2 on most items with the exception of rails, axles, and malleable cast. Typographical errors appeared in last week's prices of machine shop turnings, shoveling turnings, and mixed borings and turnings. These prices have been corrected.

PHILADELPHIA—Shipments of scrap are moving very well in this market and it is understood that mills are comfortably fixed for current operations. Mills are actively seeking scrap for winter inventories but have so far been unable to accumulate reserves. Industrial and salvage scrap is still being awarded well above the dealer market. Sales of General Electric scrap were made at \$44 for No. 2, \$50.51 for low phos and \$35.51 for machine shop, all f.o.b. Philadelphia. The low phos market is \$1 higher. Railroad malleable is quoted at \$78 to \$80.

CLEVELAND—Decision of one of the major scrap producing railroads not to sell any more tonnage on an allocated or earmarked basis simultaneously set a precedent and upset the market here. Major factor in the decision was rumored to be the ICC ruling. With material moving to the highest bidder, railroad No. 1 brought \$49. The move was bullish and came at a time when there was some evidence of weakness in the market. Shipments to consumers here and in the Valley showed improvement early in the week. Converters are still causing trouble. If railroads generally adopt the policy of refusing to sell scrap on an earmarked or allocated basis, much of this tonnage may move to the smaller and in some cases marginal consumers. It may also mark the return to the supply and demand method of doing business in the scrap markets, which in turn will mean that prices will be higher before they seek lower levels—in the meantime, nobody wants to be long.

DETROIT—Scrap flow of openhearth grades continues in good volume in this area. With most mills comfortable, re-

jections are reported to be increasing. Low phos continues in strong demand but reports of sales at over-the-formula prices are becoming less frequent. Activity here is presently centered on foundry grades which have firmed noticeably during the past week. Die production for Chrysler and General Motors plus the growing shortness of pig iron are contributing factors.

BUFFALO—Uneasiness over high prices was evident last week and nobody was holding back scrap. Most of the uncertainty was engendered by shipments of German scrap and supplies made available by the shipments from abroad. Mill receipts picked up smartly and one leading consumer was estimated to have about one half of winter reserve requirements on the ground here. Prices showed no signs of cracking, but the upturn appeared to be halted for the most part. Over 6000 tons of openhearth scrap was en route in the barge canal, with shipments limited only by the availability of barges.

CINCINNATI—Price resistance is developing on the foundry grades, as a result of most foundries being in pretty fair condition. Openhearth material continues to move at going prices although there is some business being transacted here and there at more money. Brokers don't want any big orders and there is a pronounced reluctance on the part of the trade to be long on the market on almost any grade. One of the major consumers in this area is out of the market temporarily.

NEW YORK—Market conditions remain generally the same. There were no price changes this week. Shipments continued to move fairly well. The same strong demand exists in this area with no one being able to build up any semblance of a reserve.

BOSTON—The formula for No. 1 heavy melting scrap remains at \$34.40, but it is being rapidly forgotten as broker's buying prices range from \$37.00 to \$38.90 in a brisk market. No. 2 heavy melting, No. 1 and 2 bundles and busheling are quoted from \$35.50 to \$36. Chemical borings are at the peak of its recent upward move ranging from \$37.50 to \$38.50. Cast has turned somewhat spotty in price. Some dealers will not buy this in its highly uncertain state.

BIRMINGHAM—Demand still is very strong in this market for all grades of material although some buyer resistance is building up against current prices. While dealers are paying record prices for unprepared scrap delivered to them over their scales, supply remains short. Particularly tight are cast scrap and light sheet scrap for baling purposes.

ST. LOUIS — Shipments of melting grades are heavier, and mills receipts are greater than consumption, although ingot operations for the week jumped 6.6 points to 91.6. There is an undertone of weakness in foundry grades, causing a heavier movement of these items.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$42.50 to \$43.00
RR hvy. melting	43.50 to 44.00
No. 2 hvy. melting	42.50 to 43.00
RR. scrap rails	57.50 to 58.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	42.50 to 43.00
Hand bldd. new shts.	42.50 to 43.00
Hvy. axle turn.	44.00 to 44.50
Hvy. steel forge turn.	44.00 to 44.50
Mach. shop turn.	37.50 to 38.00
Shoveling turn.	39.50 to 40.00
Mixed bor. and turn.	37.50 to 38.00
Cast iron borings	39.50 to 40.00
No. 1 cupola cast.	64.50 to 65.50
Hvy. breakable cast.	58.00 to 59.00
Malleable	76.00 to 77.00
RR. knuck. and cup.	59.00 to 60.00
RR. coil springs	59.00 to 60.00
RR. leaf springs	59.00 to 60.00
Rolled steel wheels	59.00 to 60.00
Low phos.	49.50 to 50.00

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$41.50 to \$42.00
No. 2 hvy. melting	41.50 to 42.00
No. 1 bundles	41.50 to 42.00
No. 2 dealers' bundles	41.50 to 42.00
Bundled mach. shop turn.	39.50 to 40.00
Galv. bundles	39.50 to 40.00
Mach. shop turn.	36.50 to 37.00
Short shov. turn.	38.50 to 39.00
Cast iron borings	37.50 to 38.00
Mix. borings and turn.	36.50 to 37.00
Low phos. hvy. forge	51.00 to 52.00
Low phos. plates	49.00 to 50.00
No. 1 RR. hvy. melt.	44.25 to 45.50
Re-rolling rails	64.00 to 67.75
Miscellaneous rails	62.00 to 63.00
Angles & splice bars	58.00 to 59.00
Locomotive tires, cut	59.00 to 60.00
Cut bolster & side frames	50.00 to 51.00
Standard stl. car axles	75.00 to 77.00
No. 3 steel wheels	56.00 to 57.00
Couplers and knuckles	55.00 to 56.00
Rails, 2 ft and under	64.00 to 67.00
Malleable	82.00 to 83.00
No. 1 mach. cast.	70.00 to 72.00
No. 1 agricul. cast.	63.00 to 68.00
Heavy breakable cast.	63.00 to 64.00
RR. grate bars	66.00 to 67.00
Cast iron brake shoes	57.00 to 58.00
Cast iron car wheels	62.00 to 63.00

CINCINNATI

Per gross ton, f.o.b. cars:

No. 1 hvy. melting	\$40.00 to \$41.00
No. 2 hvy. melting	40.00 to 41.00
No. 1 bundles	40.00 to 41.00
No. 2 bundles	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turn.	37.00 to 38.00
Cast iron borings	36.00 to 37.00
Mixed bor. & turn.	35.00 to 36.00
Low phos., 18 in. under	62.00 to 63.00
No. 1 cupola cast.	66.00 to 68.00
Hvy. breakable cast.	60.00 to 61.00
Rails 18 in. and under	63.00 to 65.00
Rails random length	57.00 to 59.00
Drop broken	71.00 to 72.00

BOSTON

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$37.00 to \$38.90
No. 2 hvy. melting	35.50 to 36.00
No. 1 bundles	35.50 to 36.00
Nos. 1 and 2 bundles	35.50 to 36.00
Bushelings	35.50 to 36.00
Shoveling turn.	31.40 to 32.50
Machine shop turn.	29.40 to 31.50
Mixed bor. and turn.	29.40 to 31.50
Cl'n cast chem. bor.	37.50 to 38.50
No. 1 machinery cast.	64.00 to 65.00
No. 2 machinery cast.	59.00 to 60.00
Heavy breakable cast.	53.50 to 54.50
Stove plate	52.50 to 53.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	\$38.00
No. 2 hvy. melting	38.00
No. 1 bundles	38.00
New Busheling	38.00
Flashings	38.00
Mach. shop turn.	\$32.50 to 33.00
Shoveling turn.	34.50 to 35.00
Cast iron borings	33.50 to 34.00
Mixed bor. & turn.	34.50 to 35.00
Low phos. plate	42.50 to 43.00
No. 1 cupola cast.	58.00 to 62.00
Heavy breakable cast.	53.00 to 57.00
Stove plate	56.00 to 57.00
Automotive cast.	62.00 to 64.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$44.50 to \$45.50
No. 2 hvy. melting	41.00 to 41.50
No. 1 bundles	44.50 to 45.50
No. 2 bundles	41.00 to 41.50
Mach. shop turn.	36.50 to 37.50
Shoveling turn.	38.00 to 38.50
Mixed bor. and turn.	36.50 to 37.50
Clean cast chemical bor.	41.50 to 42.00
No. 1 machinery cast.	65.00 to 66.00
No. 1 mixed yard cast.	61.00 to 62.00
Hvy. breakable cast.	61.00 to 62.00
Clean auto cast.	65.00 to 66.00
Hvy. axle forge turn.	46.00 to 47.00
Low phos. plate	51.00 to 52.00
Low phos. punchings	51.00 to 52.00
Low phos. bundles	43.00 to 49.00
RR. steel wheels	53.00 to 54.00
RR. coil springs	53.00 to 54.00
RR. malleable	78.00 to 80.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$43.00 to \$44.00
No. 2 hvy. melting	40.00 to 41.00
Bundled sheets	40.00 to 41.00
Mach. shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Locomotive tires, uncut.	50.00 to 51.00
Mis. std. sec. rails	55.00 to 57.00
Steel angle bars	54.00 to 55.00
Rails 3 ft and under	60.00 to 62.00
RR. steel springs	51.00 to 52.00
Steel car axles	56.00 to 57.00
Grate bars	59.00 to 60.00
Brake shoes	59.00 to 60.00
Malleable	73.00 to 75.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast.	66.00 to 68.00
Hvy. breakable cast.	59.00 to 60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$40.00
No. 2 hvy. melting	40.00
No. 2 bundles	40.00
No. 1 busheling	40.00
Long turnings	\$27.50 to 28.50
Shoveling turnings	29.50 to 30.50
Cast iron borings	29.00
Bar crops and plate	44.00 to 45.00
Structural and plate	44.00 to 45.00
No. 1 cupola cast.	64.00 to 67.00
Stove plate	63.00 to 64.00
No. 1 RR. hvy. melt.	41.00
Steel axles	51.00 to 52.00
Scrap rails	44.00 to 45.00
Re-rolling rails	57.00 to 60.00
Angles & splice bars	51.00 to 53.00
Rails 3 ft & under	52.00 to 55.00
Cast iron carwheels	50.00 to 55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$42.50 to \$43.00
No. 2 hvy. melting	42.50 to 43.00
Mach. shop turn.	37.50 to 38.00
Short shov. turn.	39.00 to 40.00
Cast iron borings	38.00 to 39.00
Low phos.	47.50 to 48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	\$38.50 to \$39.00
No. 2 hvy. melting	37.00
No. 2 bundles	37.00
Mach. shop turn.	31.50 to 32.00
Mixed bor. & turn.	31.50 to 32.00
Shoveling turnings	33.50 to 34.00
Machinery cast.	59.00 to 60.00
Cupola cast.	56.25 to 57.25
Clean auto cast.	57.50 to 58.50
Heavy breakable cast.	56.00 to 57.00
Charging box cast.	56.00 to 57.00
Unstrp. motor blks	55.00 to 56.00
Cl'n cast chem. bor.	38.00 to 39.00

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$47.00 to \$49.00
No. 2 heavy, melting	41.75 to 42.25
No. 1 bundles	41.75 to 42.25
No. 2 bundles	41.75 to 42.25
No. 1 busheling	41.75 to 42.25
Mach. shop turn.	36.75 to 37.25
Shoveling turn.	37.25 to 38.00
Cast iron borings	37.75 to 38.25
Mixed bor. and turn.	36.75 to 37.25
Clean auto cast.	63.00 to 64.00
Mixed cupola cast.	63.00 to 64.00
Charging box cast.	59.00 to 60.00
Stove plate	62.00 to 63.00
Stove auto cast.	60.00 to 61.00
RR. malleable	70.00 to 75.00
Small indi. malleable	47.00 to 49.00
Low phos. plate	47.25 to 50.00
Scrap rails	50.00 to 52.00
Rails 3 ft & under	57.00 to 58.00
RR steel wheels	51.00 to 53.00
Cast iron carwheels	51.00 to 52.00
RR. coil & leaf spgs.	51.00 to 52.00
RR. knuckles & coup.	51.00 to 52.00

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	\$42.00 to \$42.50
No. 2 hvy. melting	42.00 to 42.50
No. 1 bundles	42.00 to 42.50
No. 1 busheling	42.00 to 42.50
Drop forge flashings	42.00 to 42.50
Mach. shop turn.	37.00 to 37.50
Shoveling turn.	38.50 to 39.50
Steel axle turn.	42.00 to 42.50
Cast iron borings	37.50 to 38.50
Mixed bor. & turn.	36.50 to 37.50
Low phos. 2 ft and under	47.00 to 47.50
No. 1 machinery cast	72.00 to 74.50
Malleable	79.00 to 81.00
RR. cast.	76.00 to 77.00
Railroad grate bars	60.00 to 62.00
Stove plate	61.00 to 62.00
RR. hvy. melting	43.00 to 43.50
Rails 3 ft and under	63.50 to 64.50
Rails 18 in. and under	65.00 to 66.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	\$37.50
No. 2 hvy. melting	37.50
No. 2 bales	37.50
No. 3 bales	34.00
Mach. shop turn.	18.00
Elec. fur. 1 ft under	36.00 to 40.00
No. 1 cupola cast	50.00 to 51.00
RR. hvy. melting	36.00
Rails	39.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	\$37.50
No. 2 hvy. melting	37.50
No. 1 bales	37.50
No. 2 bales	37.50
No. 3 bales	34.00
Mach. shop turn.	20.00
No. 1 cupola cast.	45.00 to 50.00
RR. hvy. melting	32.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	\$27.50 to \$30.00
Elec. fur. 1 ft and under	36.50 to 40.00
No. 1 cupola cast.	40.00 to 45.00
RR. hvy. melting	28.50

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	\$22.00*
No. 1 bundles	22.00*
No. 2 bundles	21.50*
Mechanical bundles	20.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, re-rolling	26.00*
Bushelings	17.00*
Bushelings, new fact, prop'd.	21.00*
Bushelings, new fact, unprop'd.	16.00*
Short steel turnings	17.00*
No. 1 cast	42.00 to 46.00
No. 2 cast	35.00 to 37.00

*Ceiling Price.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

... News and Market Activities

Mexico's Export Tax May Up Metal Prices

New York

• • • Lead, zinc and antimony producers from ores and concentrates shipped in from Mexico are still anxiously awaiting clarification of the Mexican government decree establishing a 15 pct ad valorem tax on exports. As the order is worded, it appears to be applicable to exports of ores and concentrates, but clarification of this point has been requested. If the tax applies, most producers believe that the increased cost to them would require increases in the domestic market prices of these metals. Trade factors report that the tax is not applicable to silver bullion exports. This does not necessarily indicate how the Mexican government will rule on the ores and concentrates as an increase in production of silver for export is projected by the Government.

The Government action was taken in conjunction with a measure for devaluation of the peso. This serves to raise the living costs of Mexican miners as most of their industrial and consumer goods are bought in dollars from the United States. While coupled with a wage control measure, metals producers fully expect it to result in a wage increase demand from miners that would add further to ore and concentrates costs.

Copper

• • • The major producers who had not yet opened their October books last week expected to do so within a few days. In the meantime some October business was being placed by others. The price is firm at 23.50¢ and present indications are that copper require-

ments may continue high for the balance of the year. The demand from wire mills and brass mills continues heavy although their backlogs have declined sharply and they are operating on fairly current orders. The present copper price has reacted on small lot consumers who are not generally in the market now. Export sales volume is low due to the unexpected delay in getting ECA authorizations into effect.

Offsetting these influences, it is expected that the requirements of the Munitions Board stockpile will be likely to cushion the market for some time against the possibility of minor declines in demand. Inventories of copper and shapes at the refineries, reported at 80,469 tons at the end of July, are at a minimum low point when it is considered that they represent inventories of all forms of copper for eight refineries and include nearly 8000 tons of shapes produced from privately owned scrap on a toll basis. The refineries must build up these stocks as soon as the condition of the market permits it, according to market sources. Likewise, consumers' stocks, now inadequate, must be rebuilt. It is also expected that with time, the volume of export demand must grow larger.

Aluminum

• • • Several weeks ago aluminum producers were actively working on a changeover in their method of pricing to the f.o.b. mill basis. This project has been set aside for the time being. Like other producers of nonferrous metals that have so far made no changes in their pricing methods, aluminum producers believe that the f.o.b. mill system will be given serious consideration by Congress when it

reconvenes. In the meantime they believe there is no reason to modify long established distribution methods.

It has been learned that the government has been applying pressure to large producers of aluminum scrap to encourage them to sell scrap direct to primary producers rather than through the usual dealer channels. It is apparently felt by procurement officials that the direct return of scrap will divert tonnage from secondary metals into primary production and help to ease the shortage of aluminum mill products required for the aircraft program.

Tin

• • • Some factors in the tin market have found that the small lot consumers are no longer interested in buying tin at the current price. Others find no change in small lot activity. Most observers are rather surprised at the moderate objective of the Munitions Board in setting the total purchase requirement until the balance of the year at only 4500 long tons. It is believed that there has been little or no stockpiling of tin in the postwar period and that the present stock comprises only the 12,500 tons formerly held by the Navy. Based on a 5-year requirement for the country, market factors have understood that the ultimate stockpile objective would total some 200,000 to 300,000 tons. If purchased at the current price, such objectives would cost between \$462 to \$692 million. The 4500 tons will cost nearly \$10 million.

Scrap Price Drop Sharp

New York

• • • Marked declines were in effect last week in the prices being offered by dealers for aluminum scrap. This is not due to lower buying prices by ingot producers, but to complete inactivity in the market. Declines of 1½¢ occurred in cast grades, sheet and utensils, and Dural clips. Pistons and struts, and 2S clips were lowered 1½¢.

Nonferrous Metals Prices

	Sept. 8	Sept. 9	Sept. 10	Sept. 11	Sept. 13	Sept. 14
Copper electro, Conn.	23.50	23.50	23.50	23.50	23.50	23.50
Copper, Lake, Conn.	23.625	23.625	23.625	23.625	23.625	23.625
Tin, Straits, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	16.00 to 17.00
Aluminum pig	15.00 to 16.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$40.00
Cadmium, del'd	\$1.90
Cobalt, 97-99% (per lb)	\$1.65 to \$1.72
Copper electro, Conn. Valley	23.50
Copper, lake, Conn. Valley	23.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$110 to \$120
Lead, St. Louis	19.30
Lead, New York	19.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$75 to \$78
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$93 to \$96
Silver, New York, cents per oz.	75.25
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Zirconium copper, 20 pct Zr, per lb contained Zr	\$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot		
No. 115	20.00*	22.00
No. 120	19.50*	21.50
No. 123	19.00*	21.00
80-10-10 ingot		
No. 305		27.25
No. 315		24.25
88-10-2 ingot		
No. 210		33.00
No. 215		31.00
No. 245	24.50*	25.75
Yellow ingot		
No. 405	15.75*	17.50
Manganese bronze		
No. 421		23.00
* F.o.b. Philadelphia.		

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.20 copper, max.	26.50-27.50
0.60 copper, max.	26.25-26.75
Piston alloys (No. 122 type)	24.25-24.75
No. 12 alum. (No. 2 grade)	23.50-24.00
108 alloy	23.50-24.25
195 alloy	23.50-24.50
13 alloy	26.00-27.00
AXS-679	24.00-24.50

Steel deoxidizing aluminum, notch-bar granulated or shot:

Grade 1-95 pct-95½ pct.	24.50-25.50
Grade 2-92 pct-95 pct.	24.00-25.00
Grade 3-90 pct-92 pct.	23.00-24.00
Grade 4-85 pct-90 pct.	22.75-23.50

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	40%
Electrodeposited	34%
Rolled, oval, straight, delivered	37.34
Ball anodes	38%
Brass, 80-20	
Cast, oval, 15 in. or longer	35%
Zinc, oval, 99.99	22.50
Ball anodes	20.50
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.00
Silver 999 fine, rolled, 100 oz. lots, Per troy oz.	83

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	46.00
Copper sulfate, 99.5, crystals, bbls.	9.35
Nickel salts, single or double, 100 lb bags, frt. allowed	17.50
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	64%
Sodium cyanide, 96 pct domestic 100 lb drums	16.00
Zinc cyanide, 100 lb drums	37.00
Zinc sulfate, 84 pct, granules, bbls, monohydrated, frt. allowed	7.90

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 8S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.	
Plate: ¼ in. and heavier; 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.	
Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69¢; 23 to 25, 33.4¢ to 90¢; 35 to 37, 40.8¢ to \$1.25; 47 to 49, 58.7¢ to \$1.84.	
Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ¾ to 1½ in., 29¢ to 43¢; 1½ to 2 in., 30¢ to 46.5¢; 2 to 3 in., 32.5¢ to 53.5¢; 3 to 4 in., 35.5¢ to 62¢.	
Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.	
Screw Machine Stock: Drawn, ¼ to 1½ in., 11S-T3, R317-T4, 48¢ to 34¢; cold-finished, ¾ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ¾ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1½ to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2½ to 3½ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.	
Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43¢ to 31¢; 56S, 45.5¢ to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5¢ to 33¢; 75S-T6, 75¢ to 54¢.	

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plates: Mn. FSA. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 69¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-\$1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher.	
Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1 to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.	
Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢; 1 to 1.749, 44¢; 2 to 4, 42¢. Other alloys higher.	
Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft. per. up to 3.5 in., 55¢; 0.22 to 0.25 lb. per ft. per. up to 5.9 in., 51¢; 0.50 to 0.59 lb. per ft. per. up to 8.6 in., 47¢; 1.8 to 2.59 lb. per ft. per. up to 19.5 in., 44¢; 4 to 6 lb. per ft. per. up to 28 in., 43¢. Other alloys higher.	
Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, ¼ to ½, \$1.14; ¾ to 1, \$1.02; 1½ to 2, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ¾ to 1, 85¢; ¾ to 1, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ¾ to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.	

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	53	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	36.78		37.18
Copper, hot-rolled		33.28	
Copper, drawn		34.28	
Low brass	38.07*	34.85	35.16
Yellow brass	36.76*	33.44	33.76
Red brass	38.55*	35.33	35.64
Naval brass	33.92	32.67	38.61
Leaded brass		28.30	
Commercial bronze	39.29*	36.32	36.63
Manganese bronze	37.51	36.01	42.11
Phosphor bronze, 5 pct	57.80*	56.30	56.05
Muntz metal	33.47	32.22	36.66
Everdur, Herculeoy, Olympic, etc.	40.43	40.67	41.73
Nickel silver, 10 pct		46.42	44.20
Architectural bronze			32.33
* Seamless tubing.			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	21½	20%
Yellow brass	18	17½
Red brass	19½	19
Commercial bronze	19½	19
Manganese bronze	17½	16%
Leaded brass rod ends	17½	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	20.00-20.25
No. 2 copper wire	19.00-19.25
Light copper	18.00-18.25
Refinery brass	17.75*-18.25*

* Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	19.25
No. 2 copper, wire	18.25
Light copper	17.25
No. 1 composition	16.50
No. 1 comp. turnings	16.25
Rolled brass	12.75
Brass pipe	12.50
Radiators	13.75
Heavy yellow brass	12.00

Aluminum

Mixed old cast	10.50
Mixed old clips	10.50
Mixed turnings, dry	10.00
Pots and pans	11.00
Low copper	11.50

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 heavy copper and wire	17½-17¾
No. 2 heavy copper and wire	16½-16¾
Light copper	15½-16
Auto radiators (unsweated)	10¾-11½
No. 1 composition	13¼-13½
No. 1 composition turnings	12¾-13
Clean red car boxes	9¾-10
Cocks and faucets	9¾-10
Mixed heavy yellow brass	8¼-8¾
Old rolled brass	9¾-10
Brass pipe	10¼-10½
New soft brass clippings	13¼-14
Brass rod ends	11-11½
No. 1 brass rod turnings	10¼-10¾

Aluminum

Alum. pistons and struts	7½-8
Aluminum crankcases	9-9½
2S aluminum clippings	11½-12
Old sheet & utensils	9-9½
Borings and turnings	5-5½
Misc. cast aluminum	9-9½
Dural clips (24S)	9-9½

Zinc

New zinc clippings	10-10½
Old zinc	7¾-8¼
Zinc routings	4-4½
Old die cast scrap	4½-5

Nickel and Monel

Pure nickel clippings	19-20
Clean nickel turnings	15-16
Nickel anodes	18-19
Nickel rod ends	19-20
New Monel clippings	14-15
Clean Monel turnings	10-11
Old sheet Monel	12-12½
Old Monel castings	10-11
Inconel clippings	10-11
Nickel silver clippings, mixed	8-8½
Nickel silver turnings, mixed	6½-7

Lead

Soft scrap lead	17-17½
Battery plates (dry)	11-11½

Magnesium Alloys

Segregated solids	8-9
Castings	4½-5½

Miscellaneous

Block tin	81-83
No. 1 pewter	65-67
No. 1 auto babbitt	51-53
Mixed common babbitt	14½-15½
Solder joints	19½-20½
Siphon tops	50-52
Small foundry type	20-20½
Monotype	19-19½
Lino. and stereotype	18-18½
Electrotype	16½-17
New type shell cuttings	15-15½
Hand picked type shells	6½-7
Lino and stereo dross	9½-10
Electro dross	6½-7

Comparison of Prices . . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(cents per pound)	1948	1948	1948	1947
Hot-rolled sheets	3.26	3.26	3.26	2.80
Cold-rolled sheets	4.00	4.00	4.00	3.55
Galvanized sheets (10 ga)	4.40	4.40	4.40	3.95
Hot-rolled strip	3.265	3.265	3.265	2.80
Cold-rolled strip	4.063	4.063	4.063	3.55
Plates	3.42*	3.42*	3.42*	2.95
Plates wrought iron	7.85	7.85	7.85	6.85
Stain's C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$6.80	\$6.80	\$6.80	\$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90

Bars and Shapes:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(cents per pound)				
Merchant bars	3.37	3.37	3.37	2.90
Cold-finished bars	3.995	3.995	3.995	3.55
Alloy bars	3.75	3.75	3.75	3.30
Structural shapes	3.25	3.25	3.25	2.80
Stainless bars (No. 302)	28.25	28.25	28.25	26.00
Wrought iron bars	9.50	9.50	9.50	7.15

Wire:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(cents per pound)				
Bright wire	4.256*	4.256*	4.256*	3.55

Rails:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.75
Light rails	3.55	3.55	3.55	3.10

Semifinished Steel:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00†
Slabs, rerolling	52.00	52.00	52.00	45.00†
Forging billets	61.00	61.00	61.00	55.00†
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00†

Wire rod and Skelp:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(cents per pound)				
Wire rods	3.619	3.619	3.619	2.80
Skelp	3.25	3.25	3.25	2.60

† Gross ton
* Revised

Pig Iron:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(per gross ton)				
No. 2, foundry, Phila.	\$49.56	\$49.56	\$49.26	\$41.22.
No. 2, Valley furnace	43.50	43.50	43.50	36.50
No. 2, Southern Cinti.	48.14	48.14	48.14	39.75
No. 2, Birmingham	43.38	43.38	43.38	34.88
No. 2, foundry, Chicago†	43.00	43.00	43.00	36.00
Basic del'd Philadelphia	48.76	48.76	48.76	40.72
Basic, Valley furnace	43.00	43.00	43.00	36.00
Malleable, Chicago†	43.50	43.50	43.50	36.50
Malleable, Valley	43.50	43.50	43.50	36.50
Charcoal, Chicago	69.55	69.55	69.55	49.49
Ferromanganese†	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
† For carlots at seaboard.
* Revised

Scrap:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(per gross ton)				
Heavy melt'g steel, P'gh.	\$42.75	\$42.75	\$42.75	\$37.75
Heavy mlt'g steel, Phila.	45.00	45.00	45.00	36.75
Heavy melt'g steel, Ch'go	41.75	41.75	41.75	38.75
No. 1, hy, comp. sh't, Det.	38.00	38.00	38.00	34.50
Low phos. Young'n.	47.75	47.75	47.75	44.50
No. 1, cast, Pittsburgh	65.00	65.00	65.00	43.00
No. 1, cast, Philadelphia	65.50	65.50	65.50	47.50
No. 1, cast, Chicago	71.00	72.00	74.50	49.50

Coke, Connellsville:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(per net ton at oven)				
Furnace coke prompt	\$15.00	\$13.50	\$13.50	\$12.00
Foundry coke, prompt	17.00	17.00	17.00	13.75

Nonferrous Metals:	Sept. 14, 1948	Sept. 7, 1948	Aug. 17, 1948	Sept. 16, 1947
(cents per pound to large buyers)				
Copper, electro, Conn.	23.50	23.50	23.50	21.50
Copper, Lake Conn.	23.625	23.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	80.00
Zinc, East St. Louis	15.00	15.00	15.00	10.50
Lead, St. Louis	19.30	19.30	19.30	14.80
Aluminum, virgin	16.00	16.00	16.00	15.00
Nickel, electrolytic	42.90	42.90	42.90	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

Composite Prices . . .

FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Sept. 14, 1948.....3.75255¢* per lb.....	\$44.74 per gross ton.....	\$43.16 per gross ton.....
One week ago.....3.75255¢* per lb.....	\$44.66 per gross ton.....	\$43.16 per gross ton.....
One month ago.....3.75255¢* per lb.....	\$44.52 per gross ton.....	\$43.16 per gross ton.....
One year ago.....3.18925¢ per lb.....	\$36.93 per gross ton.....	\$37.75 per gross ton.....

HIGH	LOW	HIGH	LOW	HIGH	LOW
1948.... 3.75325¢ July 27	3.22566¢ Jan. 1	\$44.74 Sept. 14	\$39.58 Jan. 6	\$43.16 July 27	\$39.75 Mar. 9
1947.... 3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
1946.... 2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
1945.... 2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
1944.... 2.30837¢ Sept. 5	2.21189¢ Oct. 5	\$23.61	\$23.61	19.17 Jan. 11	15.76 Oct. 24
1943.... 2.29176¢	2.29176¢	23.61	23.61	\$19.17	\$19.17
1942.... 2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941.... 2.43078¢	2.43078¢	\$23.61 Mar. 20	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 29
1930.... 2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

'Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13) San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only. (18) 0.20 to 0.50 carbon.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas.															
	Pitts- burgh	Chicago	Gary	Cleve- land	Birm- ingham	Buffalo	Youngs- town	Spar- rows Point	Granite City	Middle- town, Ohio			Detroit	Johns- town	Seattle, S. Frisco, Los Angeles	Fontana
INGOTS																
Carbon forging	\$50.00															
Alloy	\$51.00						(per net ton)									
BILLETS, BLOOMS, SLABS																
Carbon, rerolling ¹²	\$52.00				\$52.00	\$52.00	(per net ton)							\$52.00		
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	(per net ton)							\$61.00		
Alloy	\$63.00	\$63.00				63.00	(Bethlehem, Canton, Massillon = \$63.00) (per net ton)									
PIPE SKELP	3.25						3.25				Warren = 3.25					
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70		3.40	4.05 ¹³ 4.10 ¹⁴		
SHEETS																
Hot-rolled ⁶	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland = 3.25		3.45		3.95 ¹⁵		5.65
Cold-rolled ¹	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20				
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹⁶		
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70				
Long ternes ² (10 gage)	4.80		4.80							4.80						
STRIP																
Hot-rolled ³	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25		5.90
Cold-rolled ⁴	4.00	4.25		4.00	4.00	4.00	4.00	4.00			New Haven 4.00 Warren = 4.00 to 4.25	4.20 to 4.50				7.10 ¹⁸
TINPLATE																
Cokes, 1.50 lb. ⁵ base box	6.80	6.80	6.80		6.90			6.90	7.00	Warren, Ohio = \$6.80)					Pittsburg, Calif.—7.55	
Electrolytic 0.25, 0.50, 0.75 lb, box	Deduct \$1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price															
TERNES MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price															
BLACKPLATE CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct \$1.60, \$1.70 and \$1.60 respectively from 1.50 lb coke base box price.															
BLACKPLATE, h.e., 29 ga. ¹⁰	4.75	4.75	4.75					4.85								
BARS																
Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35		3.35	4.05 to 4.10		5.30
Reinforcing (billet) ⁷	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10		5.30
Cold-finished ⁸	3.95 to 4.00	4.00	4.00	4.00			4.00					4.30				
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75				3.75	4.80 ¹⁴		5.50
Alloy, cold-drawn									Massillon = 4.65							
PLATE																
Carbon steel ¹¹	3.40 to 3.60	3.40	3.40	3.40	3.40	3.45	3.40	3.40	Coatesville = 3.75, Claymont = 3.95 Geneva, Utah = 3.40, Harrisburg — 5.85			3.65	3.45	4.30 ¹⁶		5.80
Floor plates	4.55	4.55		4.55					Conshohocken = 4.55							
Alloy	4.40	4.40							Coatesville = 5.10							
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30, Geneva, Utah = 3.25				3.30	3.85 to 4.30		5.75
MANUFACTURERS' WIRE ⁹																
Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.15	4.25	Duluth = 4.15 Worcester = 4.45				4.15	5.10 ¹³		
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-6.15		
PILING, Steel sheet	4.05	4.05				4.05										

PRICES

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. producing point

Product	Chromium Nickel			Straight Chromium		
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Billets, forging	25.25— 27.75	24.75— 26.50	19.25— 21.50	19.25— 21.75	23.00— 25.00	28.00— 30.75
Bars, hot-rolled	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Bars, cold-finished	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Plates	34.75— 34.00	32.50— 32.00	25.75— 26.00	26.50	30.75— 31.00	36.25— 39.00
Shapes, structural	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Sheets	43.00— 39.50	40.75— 37.50	32.00— 33.00	34.75— 35.50	39.00— 39.50	43.50— 50.00
Strip, hot-rolled	28.00— 27.75	25.75	20.25— 21.25	21.00— 21.75	28.50	41.75— 45.00
Strip, cold-rolled	35.75— 35.00	33.50— 33.00	26.50— 27.00	27.00— 27.50	38.50	62.25— 60.00
Wire, cold-drawn	29.25— 30.00	28.50	22.50— 23.00	23.00— 23.50	27.00	33.00— 32.50
Wire, flat, cold-rolled	35.75	33.25	26.25	26.75	38.25	62.00
Rod, hot-rolled	29.75	28.50	22.00	22.50	26.75	31.75
Tubing, seamless	79.25	79.25	.....	75.25	.....	.....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill

W	Cr.	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium					52¢
Oil harden manganese					29¢
Special carbon					26.5¢
Extra carbon					22¢
Regular carbon					19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base, HR cut lengths, f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95*
Motor	6.70*
Dynamo	7.50
Transformer 72	8.05
Transformer 65	8.60
Transformer 58	9.30
Transformer 52	10.10

*Granite City add 20¢.

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb.....	\$3.20
Joint bars, 100 lb.....	4.25
Light rails (from billets) per 100 lb	3.55

Base per lb

Cut spikes	5.35¢
Screw spikes	8.00¢
Tie plate, steel	4.05¢
Tie plates, Pittsburgh, Calif.*.....	4.20¢
Track bolts	7.50¢
Track bolts, heat treated, to railroads	8.50¢

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.00¢
0.41 to 0.60 carbon.....	5.50¢
0.61 to 0.80 carbon.....	6.10¢
0.81 to 1.05 carbon.....	8.05¢
1.06 to 1.35 carbon.....	10.35¢
Worcester, add 0.30¢	

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Coatesville, Pa.	*27.00	
Washington, Pa.	*26.50	*22.50
Claymont, Del.	*26.50	
Conshohocken, Pa. ..		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville..	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville..	29.00	
Aluminized steel sheets		
Hot dip, 20 gage, f.o.b. Butler, Pa.	9.25	

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails* 103	123	
Galvanized nails*	103	123
Woven wire fence†.....	109	132
Fence posts, carloadstt..	114	...
Single loop bale ties.....	106	130
Galvanized barbed wire**	123	143
Twisted barbed wire...	123	...

* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	Pittsburg, Calif.
Annealed fence wire†.....	\$4.80	\$5.75
Annealed, galv. fencing†.	5.25	6.20
Cut nails, carloadst.....	6.75	...

† Add 30¢ at Worcester; 10¢ at Sparrows Pt. (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Ota-coley	Yeloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates.....	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.65
Sheets									
Hot-rolled ..	4.95	4.95	4.95	5.25	4.95	4.95	4.95	4.95	5.25
Cold-rolled ..	6.05	6.05	6.05	...	6.05	6.05	6.05	6.05	6.35
Galvanized ..	...	6.75	...	...	...	6.75	...	...	...
Strip									
Hot-rolled ..	4.95	4.95	4.95	...	4.95	4.95	4.95	4.95	5.25
Cold-rolled ..	...	...	6.05	...	...	6.05	5.05	...	6.35
Shapes									
.....	...	4.95	...	...	4.95	5.05	4.95	...	...
Beams									
.....	...	4.95	...	...	...	...	...	...	...
Bars									
Hot-rolled ..	5.10	5.10	5.10	...	5.10	5.10	5.10	...	5.40
Bar shapes									
.....	...	5.10	...	...	5.10	5.10	5.10	...	...

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. mills,
steel butt weld and seamless.
Base price, \$200.00 per net ton.

Standard, threaded and coupled

Steel, butt weld*	Black	Galv.
¾-in.	46	26½
1-in.	48½	29½
1½-in.	49	30
2-in.	49½	30½
2½-in.	50	31
3-in.	50½	31½

Wrought Iron, butt weld

¾-in.	+20½	+50
1-in.	+10½	+39
1 and 1½-in.	+4½	+30
2-in.	+1½	+26½
2½-in.	+2	+25

Steel, lap weld

2-in.	39½	20
2½ and 3-in.	43½	24
3½ to 6-in.	45½	26

Steel, seamless

2-in.	38½	19
2½ and 3-in.	41½	22
3½ to 6-in.	43½	24

Wrought Iron, lap weld

2-in.	+7½	+24
2½ to 3½-in.	+5	+29½
4-in.	list	+23½
4½ to 8-in.	+2	+25

Extra Strong, plain ends

Steel, butt weld		
¾-in.	41	22
1-in.	45	26
1½-in.	47	29
2-in.	47½	29½
2½-in.	48	30
3-in.	48½	30½
3½ and 4-in.	49	31

Wrought Iron, butt weld

¾-in.	+16	+44
1-in.	+9½	+37
1 to 2 in.	+1½	+26

Steel, lap weld

2-in.	38½	20
2½ and 3-in.	43½	25
3½ to 6-in.	45½	26

Steel, seamless

2-in.	37½	19
2½ and 3-in.	41½	23
3½ to 6-in.	45	26½

Wrought Iron, lap weld

1-in.	+4½	+30½
2½ to 4-in.	+5	+19
4½ to 6-in.	+1	+23½

Basing discounts for standard pipe are for threads and couplings. For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all butt weld. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

* F.o.b. Fontana prices average 17 points lower discount (higher price) on black, 14 points on galvanized.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft. at mill in carload lots, cut length 4 to 24 ft. inclusive.

OD	Gage	Seamless		Electric Weld	
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago.....	\$106.70
6 to 24-in., del'd N. Y.....	103.50 to 108.40
6 to 24-in., Birmingham.....	93.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less.....	120.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Percent Off List
½ in. & smaller x 6 in. & shorter..	35
9/16 to 1 in. x 6 in. & shorter.....	37
¾ in. & larger x 6 in. & shorter....	34
All diam, longer than 6 in.....	30
Lag, all diam over 6 in. longer.....	35
Lag, all diam x 6 in & shorter.....	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller.....	35
9/16 to 1 in. inclusive.....	34
1½ to 1½ in. inclusive.....	32
1½ in. and larger.....	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts

	USM	SAE
7/16 in. and smaller	41	
½ in. and smaller.....	38	
¾ in. through 1 in.	39	
9/16 in. through 1 in.....	37	
1½ in. through 1½ in.	35	37
1½ in. and larger	28	

In full case lots, 15 pct additional discount.

Stove Bolts

Packages, nuts separate.....	61.75
In bulk	70.00

Large Rivets

	(½ in. and larger)	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		\$6.75
F.o.b. Lebanon, Pa.		6.75

Small Rivets

	(7/16 in. and smaller)	Percent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham		48

Cap and Set Screws

	Percent Off List
(In packages)	
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright.....	46
¾ to 1 in. x 6 in., SAE (1035), heat treated	35
Set screws, oval points	19
Milled studs	5
Flat head cap screws, listed sizes....	28
Fillister head cap, listed sizes.....	

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

	Base price per short ton
Effective CaF ₂ Content:	
70% or more	\$35.00
65% but less than 70%.....	34.00
60% but less than 65%.....	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f.	
New York, ocean bags....	7.9¢ to 9.0¢
Domestic sponge iron, 98+%	
Fe	9.5¢ to 16.0¢
Electrolytic iron, annealed,	
99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed,	
minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus	
300 mesh, 98+%, Fe....	63.0¢ to 80.0¢
Carbonyl iron, minus 300	
mesh, 98%, 99.8+% Fe....	90.0¢ to \$1.75
Aluminum	24.00¢
Antimony	47.67¢
Brass	27.25 to 37.25¢
Copper, electrolytic	33.625¢
Copper, reduced	33.75¢
Cadmium	\$2.55
Chromium, electrolytic, 99%	
min.	\$3.50
Lead	26.00¢
Manganese	50.0¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	67.00¢
Nickel, spherical, minus 30	
Mesh, unannealed	61.00¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302.....	75.0¢
Tin	\$1.15
Tungsten, 95%, 99%.....	\$2.90

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	
Connellsville, Pa.	\$14.50 to \$15.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$18.00
Foundry, Byproduct	
Chicago, del'd	\$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.....	21.50
Philadelphia, f.o.b.	20.55
Swedeland, Pa., f.o.b.	20.50
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	17.86

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
First quality, Pa., Md., Ky., Mo.	
(except Salina, Pa., add \$5).....	\$80.00
No. 1 Ohio.....	74.00
Sec. quality, Pa., Md., Ky., Mo.....	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50).....	11.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.....	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.....	95.00
Super Duty, Hays, Pa., Athens, Tex.	\$5.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.).....	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	\$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick

Standard chemically bonded, Balt., Chester

	Per Net Ton
Magnesite Brick	
Standard, Balt., and Chester.....	\$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

	Std. ¾-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed.....	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines.....	\$30.50 to 31.00
In sacks with fines.....	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, pet net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢.....	\$11.85
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PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.
(Metropolitan area delivery, add 15¢ to base, exc.; New York, add 20¢)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4616 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Philadelphia.....	\$5.15- 5.71	\$6.31- 6.57	\$7.27- 7.47	\$5.35- 5.66	6.51	\$5.37- 5.50	5.09- 5.20	5.35- 5.5	\$6.16- 6.26	\$9.14	\$9.29	\$10.54	\$10.69
New York.....	5.40- 5.9 ^P	6.28 ¹ - 6.43 ¹	7.25- 7.54	5.68- 5.88	6.48- 6.73	5.78	5.32- 5.58	5.53- 5.63	6.18- 6.38	9.17- 9.53	9.32- 9.68	10.40- 10.77	10.55- 10.92
Boston.....	5.48- 5.64	6.39	7.58- 7.69	5.54- 5.69	6.76- 6.79	5.74	5.39- 5.54	5.48- 5.59	6.24- 6.34	9.40- 9.44	9.55- 9.59	10.84- 10.94	10.92- 11.09
Baltimore.....	5.28	6.18	7.16- 7.38	5.34	....	5.53	5.33	5.39	6.13	....	....	....	....
Chicago.....	4.85- 5.10	5.75- 5.95	6.95- 7.05	4.85- 5.30	6.15	5.10	4.90	4.90	5.70	9.00	9.15	10.40	10.55
Milwaukee.....	5.02- 5.07	5.92	7.12- 7.22	5.02- 5.37	6.32	5.22- 5.27	5.07	5.07	5.87	9.15- 9.17	9.32	10.52- 10.57	10.67- 10.72
Cleveland.....	4.98- 5.20	5.75 ¹ - 6.04 ¹	7.18- 7.24	5.02- 5.65	6.70	5.35- 5.54	5.16- 5.42	5.15- 5.34	5.70- 5.95	9.14- 9.29	9.29- 9.79	10.54	10.69
Buffalo.....	4.85- 5.10	5.75- 5.85	7.55- 7.70	5.55- 5.56	6.35	5.45- 5.46	5.10	5.15- 5.20	5.90- 6.05	9.05- 9.35	9.40- 9.50	10.75	10.90
Detroit.....	5.20- 5.55	6.05- 6.5 ¹	7.45	5.25- 5.70	6.25- 6.65	5.50- 5.55	5.30- 5.37	5.30- 5.52	6.02- 6.07	9.31- 9.55	9.20- 9.47	10.72- 10.95	10.87- 11.10
Cincinnati.....	5.14- 5.36 ⁸	5.82- 6.21 ⁸	6.97- 7.45	5.25- 5.62 ⁹	6.31	5.50- 5.71 ⁸	5.30- 5.47 ⁸	5.30- 5.62 ⁹	6.08- 6.17 ⁸	9.31- 9.35	9.50- 9.51	10.75- 10.76	10.90- 10.91
St. Louis.....	5.19	6.04- 6.09	7.29- 7.39	5.19- 5.79	6.49	5.39- 5.44	5.24	5.24	6.04	9.34	9.49	10.74	10.89
Pittsburgh.....	4.85- 4.90	5.75 ¹	6.95- 7.05	5.00- 5.35	5.95	5.05- 5.25	4.90- 5.15	4.90- 5.10	5.65- 5.80	9.00	9.15	10.40	10.55- 10.80
St. Paul.....	5.41	6.31	7.30- 7.61	5.41	....	5.86	5.46	5.46	6.28	9.56	9.71	10.86	11.11
Omaha.....	5.92	....	9.18	5.92	....	6.17	5.97	5.97	6.77	....	....	....	....
Birmingham.....	5.05 ¹¹	6.36	6.45	5.05 ¹¹	6.36	5.25 ¹¹	5.00 ¹¹	5.00 ¹¹	6.51	....	....	....	....
Houston.....	6.40	....	8.80	6.75	....	6.35	6.20	6.40	7.60	9.80	9.85	10.75	10.85
Los Angeles.....	6.30- 6.40	7.85 ¹ - 7.90	7.95- 8.65	6.80- 6.86	9.35 ⁵	5.96- 6.10	5.75- 5.90	6.05	7.85 ¹⁵ - 7.95	10.35 ¹⁵	10.20 ¹⁵	11.75 ¹⁵	11.95 ¹⁵
San Francisco.....	5.95 ³	7.15 ²	7.65	6.40 ⁸	8.25	6.30	5.90	5.90	7.55	10.35 ¹⁵	10.20 ¹⁵	11.75 ¹⁵	11.95 ¹⁵
Portland.....	6.35 ⁴	7.85 ³	8.30 ²	6.70 ⁴	....	6.15 ⁴	6.10 ⁴	6.10 ⁴	8.10 ¹⁴	....	10.30 ¹⁵	....	12.05 ¹⁵
Seattle.....	6.20 ⁴ - 6.30 ⁴	7.75 ³ - 7.85 ³	7.65- 8.00	6.55 ⁴ - 6.85 ⁴	....	6.20- 6.30	6.15- 6.25	6.05 ⁴ - 6.15 ⁴	8.00 ¹⁴ - 8.10 ¹⁴	....	10.30 ¹⁵ - 10.40 ¹⁵	....	12.00 ¹⁵ - 12.05 ¹⁵
Salt Lake City.....	6.15- 8.00	7.35	8.30- 9.01	7.10- 7.45	....	6.75- 6.65	6.65- 7.00	6.95- 7.25	7.55- 8.40	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb;

strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 800 to 4999 lb; (4) 800 to

9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 600 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freights.

PRODUCING POINT PRICES						DELIVERED PRICES† (BASE GRADES)							
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem.....	44.00	.....	.....	.....	.....	Boston.....	Everett.....	\$0.50 Arb.	.....	48.75	49.25	.....	.....
Birmingham.....	42.88	43.38	.....	.....	.....	Boston.....	Steelton.....	6.27	50.27	50.77	51.27	51.77	56.27
Buffalo.....	44.00-48.00 ^a	44.00-48.00 ^a	44.50-48.50 ^a	.....	.....	Brooklyn.....	Bethlehem.....	3.90	47.90	.....	.....	.....	.....
Chicago.....	43.00	43.00	43.50	44.00	.....	Cincinnati.....	Birmingham.....	6.09	48.97	49.47	.....	.....	.....
Cleveland.....	43.00	43.50	43.50	44.00	48.00	Jersey City.....	Bethlehem.....	2.39	46.39	.....	.....	.....	.....
Duluth.....	43.00	43.50	44.00	44.50	.....	Los Angeles.....	Provo.....	6.93	49.93-	50.43	.....	.....	.....
Elle.....	42.50	43.00	43.50	44.00	.....	Mansfield.....	Cleveland-Toledo.....	3.03	45.53-46.03	46.03-46.53	46.53	47.03	.....
Everett.....	.....	48.75	48.25	.....	.....	Philadelphia.....	Bethlehem.....	2.21	46.21	.....	.....	.....	.....
Granite City.....	47.90	48.40	49.90	.....	.....	Philadelphia.....	Swedeland.....	1.31	51.31	51.81	52.31	52.81	52.81
Neville Island.....	46.00	46.50	46.50	.....	.....	Steelton.....	Steelton.....	2.81	46.81	47.31	47.81	48.31	52.81
Provo.....	43.00	43.50	.....	.....	.....	San Francisco.....	Provo.....	6.93	49.93	50.43	.....	.....	.....
Sharpsville.....	43.00	43.50	43.50	44.00	.....	Seattle.....	Provo.....	6.93	49.93	50.43	.....	.....	.....
Steelton.....	44.00	44.50	45.00	45.50	50.00	St. Louis.....	Granite City.....	0.75 Arb.	48.65	49.15	49.65	.....	.....
Struthers, Ohio.....	42.50	.....	.....	.....	.....								
Swedeland.....	50.00	50.50	51.00	51.50	.....								
Toledo.....	42.50	43.00	43.50	44.00	.....								
Troy, N. Y.....	.....	.....	.....	.....	50.00								
Youngstown.....	43.00	43.50	43.50	44.00	.....								

* Republic Steel Corp. price: Basis: pig iron at Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Buffalo as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00

pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—\$56.50; f.o.b. Buffalo—\$57.75. Add \$1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$62.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$69.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York.....\$145
 F.o.b. Birmingham.....\$150
 F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.\$145
 F.o.b. Johnstown, Pa.....\$147
 F.o.b. Rockwood, Tenn.....\$150
 F.o.b. Etna, Pa.\$148
 \$1.80 for each 1% above 82% Mn; penalty, \$1.80 for each 1% below 78%
 Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.
 Eastern Central Western
 Carload, bulk ... 8.70 8.95 9.50
 Ton lots 10.30 10.90 12.80
 Less ton lots 11.20 11.80 13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.
 16-19% Mn 19-21% Mn
 3% max Si 3% max Si
 Carloads \$61.00 \$62.00
 F.o.b. Pittsburgh . 55.00 56.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.
 96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.
 Carload, bulk 32
 L.c.l. lots 34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
 Carloads 32
 Ton lots 34
 Less ton lots 36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.
 Carloads Ton Less
 0.07% max. C, 0.06% P, 90% Mn. 23.00 24.85 26.05
 0.10% max. C. 22.50 24.35 25.55
 0.15% max. C. 22.00 23.85 25.05
 0.30% max. C. 21.50 23.35 24.55
 0.50% max. C. 21.00 22.85 24.05
 0.75% max. C.
 7.00% max. Si. 18.00 19.85 21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.
 Carload bulk 7.80
 Ton lots 9.45
 Briquet, contract, basis, carlots, bulk freight allowed, per lb of briquet 8.75
 Ton lots 10.35
 Less ton lots 11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth \$81.00, foundry, \$82.00; \$81.75 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.
 Eastern Central Western
 96% Si, 2% Fe.. 16.90 17.50 18.10
 97% Si, 1% Fe.. 17.30 17.90 18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

Eastern Central Western
 Carload, bulk ... 5.25 5.50 5.70
 Ton lots 6.85 7.45 7.75
 Less ton lots 7.75 8.35 8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 25% Si 17.50
 50% Si 9.30 9.80 10.00
 75% Si 11.80 12.10 12.85
 85% Si 13.30 13.60 14.35
 90% Si 15.00 15.30 16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.
 Cast Turnings Distilled
 Ton lots\$1.85 \$2.70 \$3.40
 Less ton lots 2.20 3.05 4.30

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.
 Eastern Central Western
 0.06% C 26.50 26.90 27.00
 0.10% C 26.00 26.40 26.50
 0.15% C 25.50 25.90 26.00
 0.20% C 25.25 25.65 25.75
 0.50% C 25.00 25.40 25.50
 1.00% C 24.50 24.90 25.00
 2.00% C 24.25 24.65 24.75
 65-69% Cr,
 4-9% C 18.60 19.00 19.15
 62-66% Cr, 4-6% C.
 6-9% Si 19.45 19.85 20.00
 Briquets—Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.
 Eastern Central Western
 Carload, bulk ... 12.50 12.75 12.85
 Ton lots 14.00 14.90 15.50
 Less ton lots.... 14.90 15.80 16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.
 High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.
 Eastern Central Western
 Carload 19.70 20.10 20.25
 Ton lots 21.85 23.15 23.95
 Less ton lots 23.35 24.65 25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.
 Eastern Central Western
 Carload 25.00 25.40 25.50
 Ton lots 27.30 27.95 29.15
 Less ton lots ... 29.10 29.75 30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point, freight allowed, 97% min. Cr. 1% max. Fe.
 Eastern Central Western
 0.20% max. C. .. 97.00 98.50 99.75
 0.50% max. C. .. 93.00 94.50 95.75
 9.00% min. C. .. 91.50 93.00 94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 30-35% Ca, 60-65% Si, 3.00% max. Fe
 Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.
 Eastern Central Western
 Carloads 16.25 16.75 18.80
 Ton lots 19.35 20.10 22.25
 Less ton lots 20.85 21.60 23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.
 16-20% Ca, 14-18% Mn, 53-59% Si.
 Eastern Central Western
 Carloads 17.50 18.00 20.05
 Ton lots 19.80 20.65 22.40
 Less ton lots 20.80 21.65 23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.
 Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.
 Eastern Central Western
 Ton lots 18.00 19.10 21.05
 Less ton lots 19.25 20.35 22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.
 Ton lots 14.60¢
 Less ton lots 15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed.
 Si 56%, Ti 9%, Ca 5%.
 Ton lots 17.90¢
 Less ton lots 19.40¢

SMZ

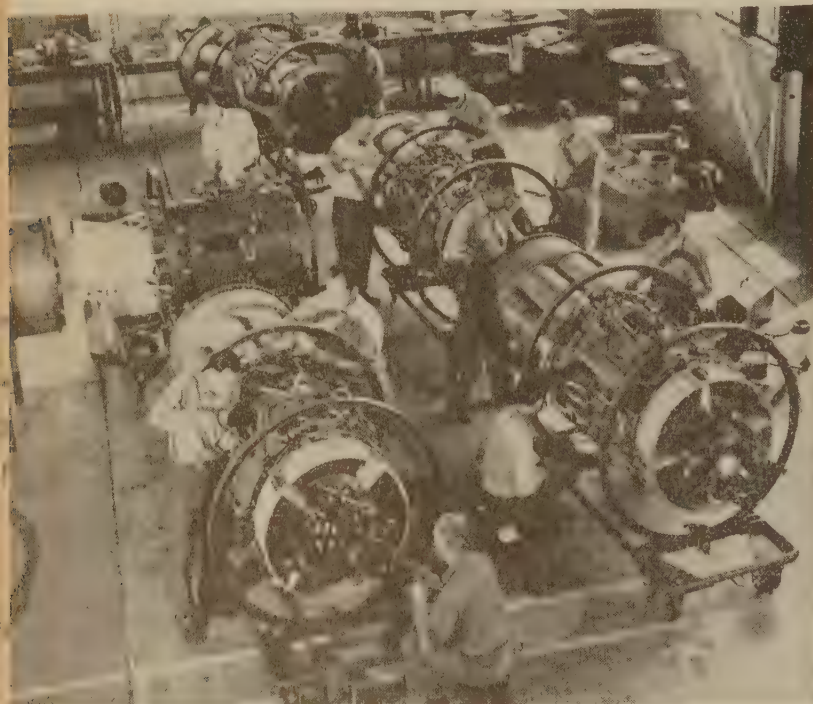
Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.
 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.
 Eastern Central Western
 Ton lots 15.75 16.85 18.80
 Less ton lots 17.00 18.10 20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed... \$2.25
 Ferrovandium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.
 Openhearth \$2.90
 Crucible 3.00
 High speed steel (Primos).... 3.10
 Vanadium pentoxide, 88-92% V₂O₅ contract basis, per pound Contained V₂O₅ \$1.20
 Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb
 Ton lots \$2.50
 Less ton lots \$2.55
 Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 95¢
 Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo. 80¢
 Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo. 80¢
 Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo. 80¢
 Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti \$1.23
 Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti \$1.35
 Less ton lots \$1.40
 High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton....\$152.50
 Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton \$65.00
 10 tons to less carload.....\$75.00
 Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
 Carload lots 18.40¢
 Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.
 Carload, bulk 6.00¢
 Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
 Carload 7.95¢
 Ton lots 8.85¢
 Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
 Car lots 10.50
 Ton lots 11.25

Boron Agents
 Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.
 Ferroboreon, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.
 Eastern Central Western
 Ton lot \$1.20 \$1.21 \$1.23
 Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.
 Ton lots \$1.89 \$1.903 \$1.935
 Less ton lots . 2.01 2.023 2.055
 Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.
 Less ton lots...\$1.80 \$1.81 \$1.84
 Silcaz, contract basis, f.o.b. plant freight allowed, per pound.
 Carload lots 39.00¢
 Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.
 No. 1 93¢
 No. 6 63¢
 No. 79 45¢
 Bortam, f.o.b. Niagara Falls
 Ton lots, per pound..... 45¢
 Less ton lots, per pound..... 50¢
 Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.
 Ton lots, per pound..... 8.625¢
 Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B..... \$6.25

U.S. Naval Maintenance Shop at Alameda Vital to Jet Plane Progress



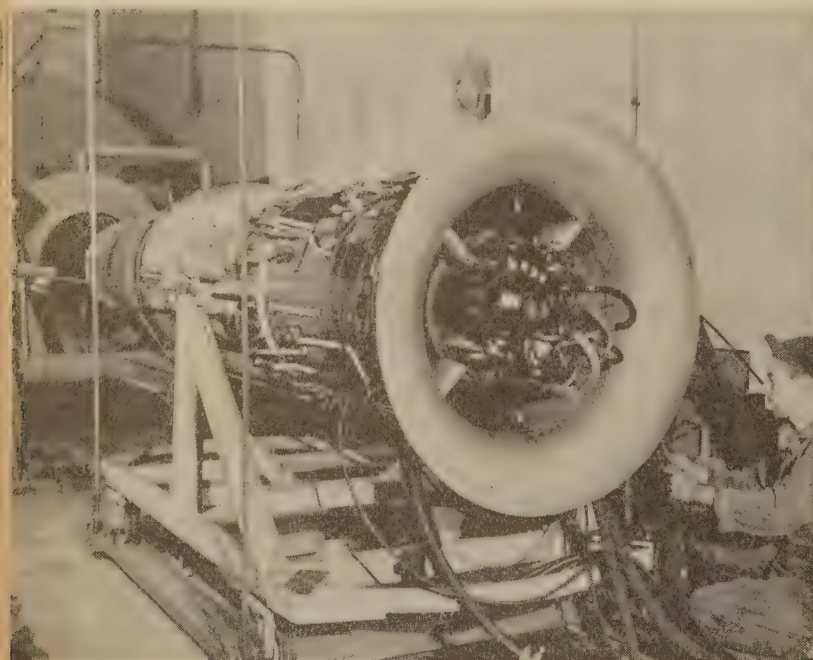
ABOVE

Naval and civilian personnel are used in overhauling J-35 jet engines which produce an equivalent of 8000 hp. This is the first plant of its type to expedite the servicing of jet engines.

• • •

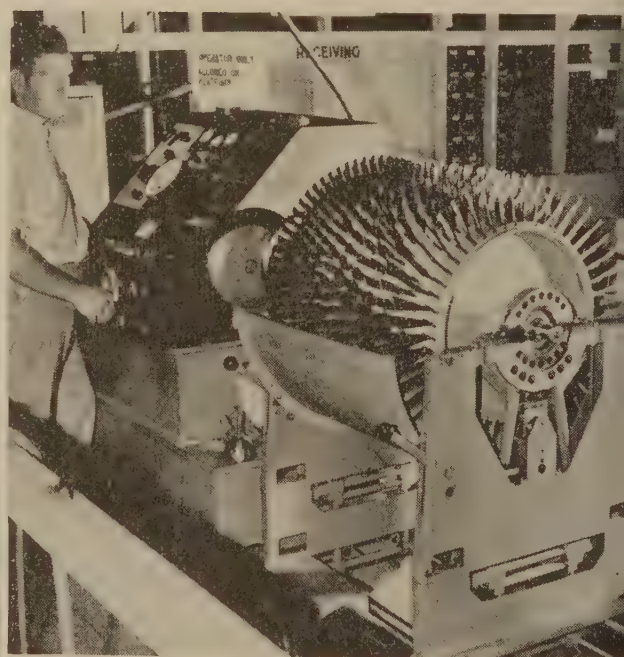
BELOW

A J-35 jet engine, installed in a ground cell, is ready to be "fired up" before being replaced in the Navy's shipboard fighter, American FJ-1 Fury.



ABOVE

A view inside the air-intake of the North American FJ-1 jet fighter from which the torpedo-shaped J-35 type engine has been removed for repairs. Activities are for the most part centered around maintenance of this engine.



ABOVE

Operator is shown testing the compressor rotor of a J-35. One of the hardest jobs in overhauling a jet engine is the careful balancing of the major moving parts; the compressor, rotor and turbine wheel.

lower cost

POWER TRANSMISSION

WITH FOOTE BROS. HYPower ENCLOSED WORM-GEAR DRIVES

These new Foote Bros. Hypower units bring you these important savings:

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SMALLER SIZE
LESS WEIGHT

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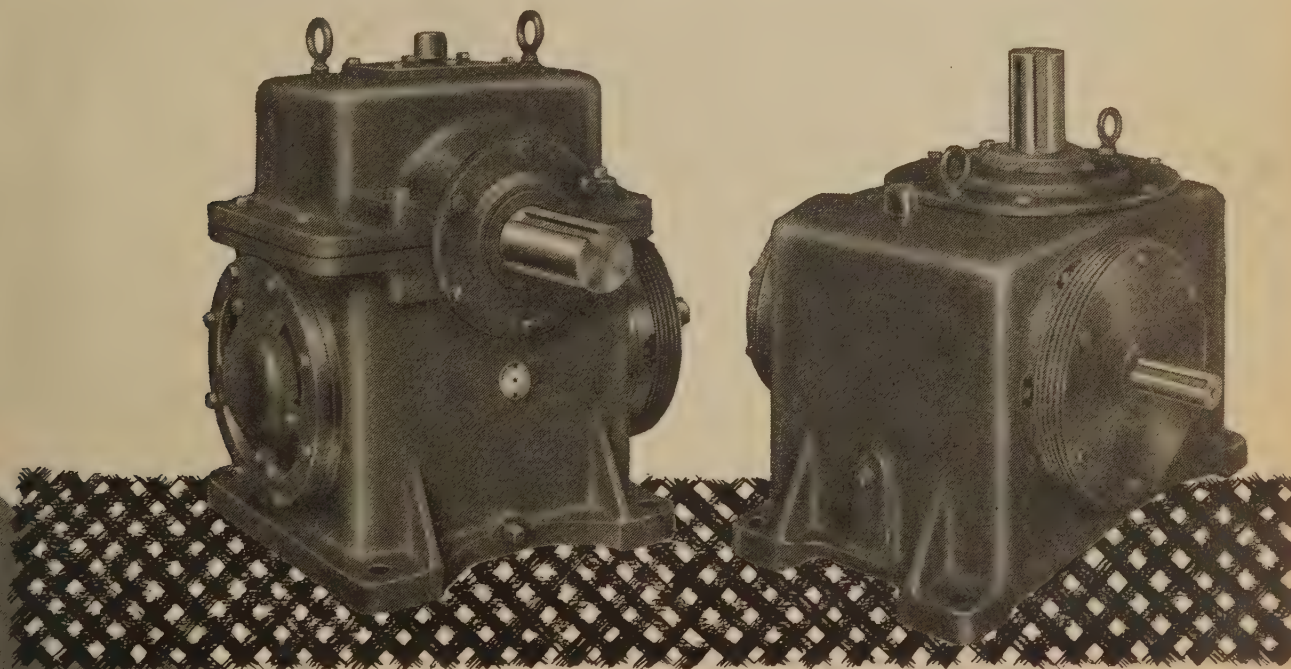
lurgical control of materials, improved manufacturing techniques, a revolutionary new method of generating gears, and a radically new design that incorporates an air channel cylinder through which passes a high velocity stream of cool air.

Because of the increased load-carrying capacity and increased thermal capacity of Foote Bros. Hypower

units, a smaller reducer may be used than would usually be required.

These units are available in both horizontal and vertical types in a wide range of sizes and ratios. They comply with the speed-ratio standards adopted by the American Gear Manufacturers Association (AGMA) and the National Electric Manufacturers Association (NEMA).

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24 Housing being Wheelabrated in Special Cabinet

EXAMPLES OF WHEELABRATOR CABINET PERFORMANCE

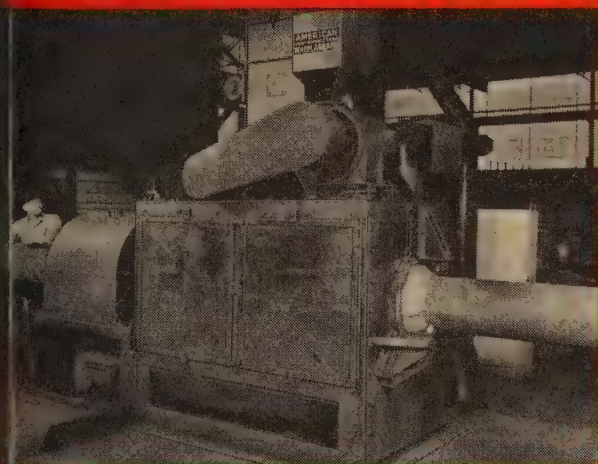
PRODUCT	EQUIPMENT FORMERLY USED	EXPERIENCE WITH FORMER EQUIPMENT	SAVINGS EFFECTED WITH WHEELABRATOR CABINET
AUTOMOTIVE CYLINDER BLOCKS	Tumbling Mills and Airblast Room	45 laborers needed . . . Excessive costs.	Elimination of 14 laborers . . . costs slashed . . . 180 blocks cleaned hourly.
RAILROAD AIR BRAKE CASTINGS	Airblast Barrels	Cleaning costs 42.6c per casting.	Wheelabrator cost 26.5c per casting. \$5,853.96 saving in first month period.
BATH TUBS AND SANITARY WARE	Airblast Rooms	Excessive cleaning costs, labor and time requirements.	60 bathtubs or up to 540 pieces of small ware Wheelabrated hourly.
RADIATOR AND BOILER SECTIONS	Wire Brushing	Gang of laborers . . . unsatisfactory cleaning quality.	Cleaning time cut 50%. Continuous cleaning with two operators.
ELECTRIC MOTOR CASTINGS	3 Large Tumbling Mills	Unable to keep up with production. Labor cost excessive.	Decrease of 7 laborers. Six hours work now Wheelabrated only 9 minutes.
GRAY IRON LOBBING CASTINGS	Airblast Room	Poor working conditions. Cleaning room a bottleneck.	Cleaning costs reduced 30%. 500% faster cleaning.

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- **American's** airless "Wheelabrator" is perfected . . . more efficient per horsepower expended than any other blasting device ever conceived.

Special Cabinet Wheelabrates 1000 dozen shovels in eight hours.



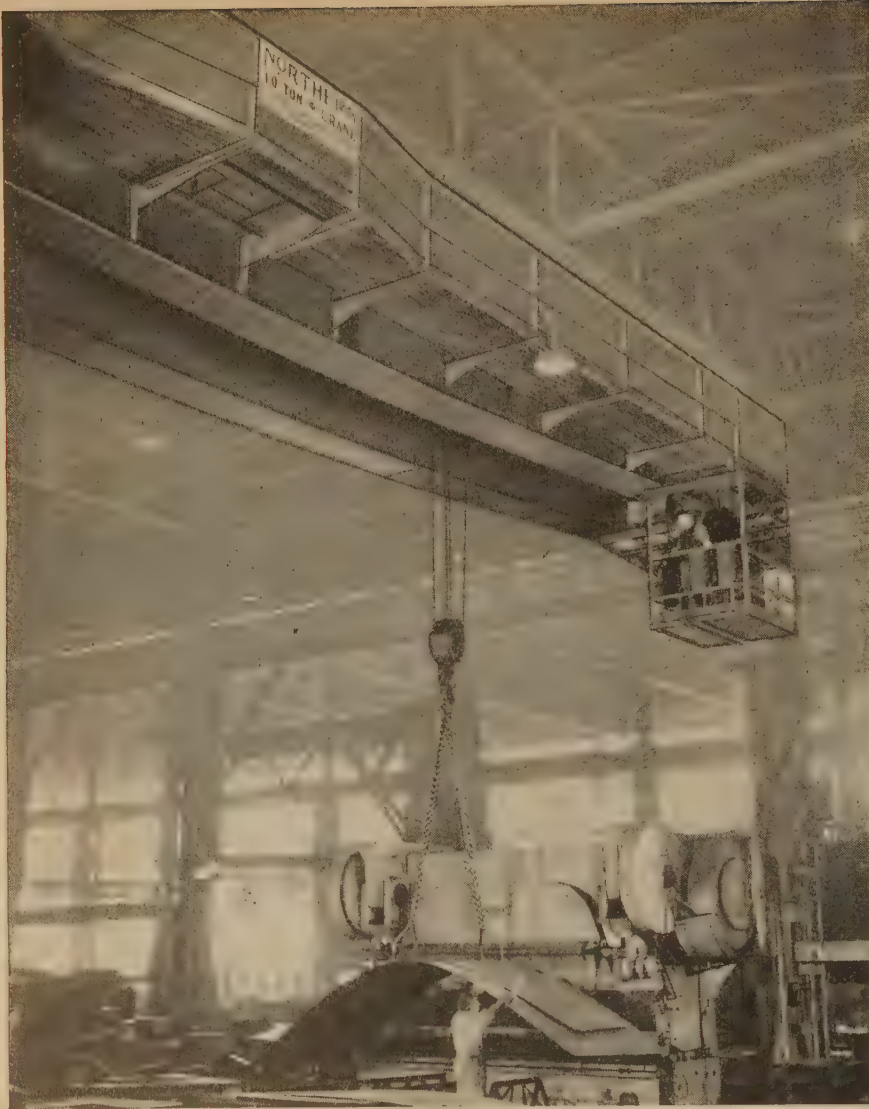
Wheelabrator Cabinet used for reconditioning corroded oil pipe line.

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New Plan for Accident Prevention Set Up By Weirton Safety Group

Pittsburgh

• • • The General Safety Committee of the Weirton Steel Co. cut its third birthday cake on Sept. 1. The committee started the fourth year of its safety program with a new plan for the reduction of unnecessary accidents, E. O. Burgham, general superintendent and chairman of the safety committee, said.

The plan calls for, (1) the appointment of "Turn Safety Captains" to keep safety on the job in the shops every hour of every day, and (2) a new safety contest between six divisions of the company's operations with a Green Cross flag to be awarded the plant winner each month and a permanent safety award going to the division having the best annual safety record. The divisions competing for these honors are: Steel Works, Strip Steel, Weirton Tin Mill, Sheet Mill Steubenville Plant, and Service and Maintenance.

The turn safety captains will be selected jointly by the plant or division manager, superintendent of the particular area to be served, plant safety manager and Safety Director Milo Gray.

In asking for the cooperation of all Weirton Steel employees in this new, intensified safety program, Mr. Burgham pointed out that "accident prevention on the job means happiness in the home." "One of the committee's functions is to plan safety for each operation in the mill." "The new turn safety captains will play an important part in seeing that these plans are carried out on the job."

Each captain will be selected so that he can normally contact not less than 10 or more than 50 employees within a reasonable and limited area. These captains will not be foremen or supervisors. On construction and repair gangs, a gang leader will be designated as captain with the safety of the group his special responsibility.

The captains will be appointed for a period of not less than one or more than 3 months. The men will be selected on the basis of personality, interest in their work,

chrome-nickel stainless strip steel with "dead-soft" workability and glistening mirror finish



● The illustration at the left is an actual photograph of a piece of .005" bright-annealed cold rolled 18-8 Stainless Thinsteel folded double with the grain.

It demonstrates the workability of this dead-soft material produced by CMP's exclusive bright-annealing process.

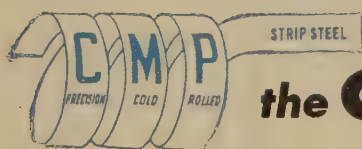
It shows the bright, mirror-like finish in which CMP annealed chrome-nickel grades are now produced.

It illustrates how you can give your product the added sales appeal of a mirror-finish in combination with greater corrosion-resistance without increasing your fabricating costs — possibly with an actual saving.

Produced in gauges as thin as .001", it opens new fields for application of cold rolled chrome-nickel stainless strip steel.

Available in long coils, it reduces down-time of coil-fed fabricating machines.

A request on your business letterhead will bring a sample which will enable you to judge how much you can improve your product usefulness and appearance with CMP bright-annealed chrome-nickel Stainless Thinsteel.



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Cardox engineered applications of low-pressure carbon dioxide give this fast-acting, non-damaging extinguishing medium maximum effectiveness in conquering fires, large or small, both indoors and out. Cardox Fire Extinguishing Systems offer broadscale protection with centrally located, compactly designed storage units with capacities of 500 pounds to 125 tons of Cardox CO₂, and Mobile Units with capacities of 750 pounds to 3 tons. Bulletin S-298.



PREVENTION

Cardox Atmosphere Inerting Systems are available to provide inert gas for continuous fire and explosion prevention in the handling and storage of flammable liquids, chemicals, paints, varnishes, and solvents, or where other materials in storage present serious fire and explosion hazards. These systems also are used to provide an economical source of inert gas as part of continuous production processes. Bulletin C-298.



DETECTION

Cardox Detection Systems, actuated by heat, smoke or flame, give prompt warning of incipient fires. These systems . . . with detectors located throughout large establishments . . . may be used purely as a warning device, or may be engineered to actuate an extinguishing system.



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their standing with fellow employees, and devotion to the principles and objectives of safety first. "For the men selected will be an opportunity for performing a worthwhile service in helping to save lives and to save fellow workers from the grief and misery of painful accidents." "It will also be recognition of an employee's qualities of leadership and a nice personal tribute to him as an outstanding industrial citizen of the Weirton organization," Mr. Burgham said.

The captains will be "sworn in" by the plant manager in a plant safety committee and will receive the full support of management in the performance of their duties.

These duties will require the captain to recognize unsafe practices, poor housekeeping, neglect to use provided safety equipment (goggles, shoes, hard hats, etc.) as specified by the safety department, and to correct in their designated areas, all such violations through personal contacts. The correction of any unsafe practice will be done in a friendly but effective manner.

The safety director will also be in constant touch with the safety captains and furnish them with a list covering in general the items for which they should be constantly on the alert. The plant safety manager will hold weekly meetings with the captains for a discussion of their activities.

Captains will be given a suitable badge with a space for his name to identify him personally to all his coworkers. After the captain has completed his term of service, he will be given a permanent emblem to identify him as having been a turn safety captain and having had an active part in the Weirton Steel safety program.

Holds "Open House"

East Chicago, Ind.

• • • Calumet district residents were guests of Youngstown Sheet & Tube Co., Wednesday, Sept. 15, at an "Open House." From 9 a. m. until 3 p. m. visitors over 14 years of age were welcomed to the steel plant and tin mill to see how steel and tinplate are made.

Four More Voluntary Allocation Programs Put Into Operation

Washington

••• Four more voluntary allocation programs affecting iron and steel products are being put into operation by the Office of Industry Cooperation.

The new voluntary agreements provide for the channeling of about 150,000 tons of steel monthly to the barge, anthracite, and oil field tank and production equipment industries and to firms holding procurement contracts with the armed services.

Meanwhile, OIC is preparing to place into effect two additional voluntary programs affecting iron and steel products. The aircraft and tanker industries have entered into preliminary agreements with the steel industry for monthly allocations and these two programs will be placed into effect in the near future, bringing the total number of voluntary allocation plans covering iron and steel products to 11.

The four programs now being put into operation affect:

Barges. Approximately 20,000 tons of steel products will be provided monthly for construction, conversion and repair of domestic freight-carrying barges and towing vessels of 3000 gross tons or less for inland waterway or harbor use.

Anthracite. A total of 2570 tons of steel products will be provided monthly for operation, maintenance and repair of anthracite mining and preparation facilities.

Oil field tank and production equipment industry. A total of 16,530 tons of steel products will be channeled monthly for use in the manufacture of oil and gas separators, heaters, emulsion treaters, bolted storage tanks, welded production tanks, gas dehydrating units, chemical feeders, bands for wood tanks, and necessary appurtenances.

Armed services. A total of 102,505 tons of steel products will be provided monthly to armed forces procurement agencies and to persons who need steel products to fill contracts for the armed forces. The plan applies to both prime contractors and subcontractors,



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. . . but your factory workers don't. When they slip, skid, fall on slippery plant floors, they are often injured . . . then lost man-hours start piling up. Keep accidents to a minimum in your plant by installing U·S·S Multigrip Floor Plate in zones where sure footing is essential. Multigrip offers skid resistance and traction in all directions, wet or dry!

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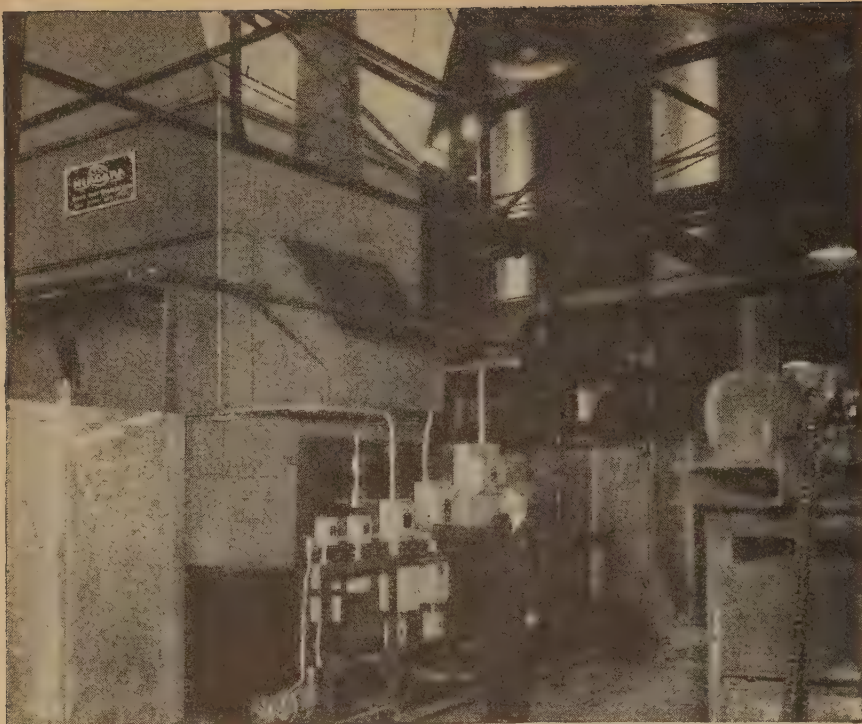
Get further information about Multigrip from your nearest steel warehouse or write to us direct.



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provided the contracts involved have been assigned official contract numbers by the armed forces. Earlier, a proposal that steel products on hand be used before obtaining steel under voluntary plan was considered and rejected by OIC.

All voluntary allocation programs are scheduled to terminate on or before Feb. 28, 1949.

Plans Added Facilities For Making Manganese, Silicon, Chrome Alloys

New York

• • • Construction of a new ferroalloys plant near Marietta, Ohio, is planned by the Electro Metallurgical Co., a unit of Union Carbide and Carbon Corp. The new plant will provide additional facilities for the company's production of silicon, manganese and chromium alloys. Power required for the electric furnace smelting of the alloys will be provided by a steam power generating station that is to be erected at the same time.

It is understood that the decision to establish a new plant was taken by the company after a study of the long term needs of the iron and steel industries for additional ferroalloy production facilities. The company's present plants are located at Niagara Falls, N. Y., Alloy, W. Va., Welland, Ont., Sheffield, Ala., Ashtabula, Ohio, and Portland, Ore. Production of low-carbon chromium and manganese alloys used for the production of stainless steels is centered at present in the first two plants mentioned.

Although construction of the Marietta plant is expected to start soon, it is not expected to be ready for production in less than two years. The plant will be located on the Ohio River, six miles south of Marietta. In addition to river transportation facilities, the plant will be served by a spur track of the Baltimore & Ohio Railroad.

In order to man the plant with personnel having the specialized technical knowledge required for the production of ferroalloys, a nucleus of engineers and technical men will be moved in from other operations of Electro Metallurgical Co., the remaining staff of workers to be employed locally.

(CONTINUED FROM PAGE 112)

• **Arthur W. Pugsley** has joined the executive staff of the Trundle Engineering Co., Cleveland, as vice-president and sales manager. Mr. Pugsley was formerly associated with the Products Engineering Co., Atlanta.

• **Morris G. Gardner** has been appointed technical director of the Newark, N. J., paint division, Pittsburgh Plate Glass Co., succeeding R. T. Ubben, who has been transferred to the technical directorship of the firm's Milwaukee division. **R. S. Hartzell** has been promoted to the position of assistant technical director.

• **Charles O. Rader**, formerly commercial sales promotion manager of the Koppers Co. Inc., Pittsburgh, has been named sales manager of Aer*a*sol Products at Bridgeport Brass Co., Bridgeport, Conn.

• **Russell J. Jose** has been named superintendent of the Ironton mine at Bessemer, Mich., of Pickands, Mather & Co. Mr. Jose has been employed by Pickands, Mather as a mining engineer on the Gogebic range since 1941.

• **Robert N. Legg Jr.** has been appointed salesman in the Harrisburg territory of Berger Mfg. Div., Republic Steel Corp., replacing **Howard Baum** who has been appointed manager of office equipment sales in Canton, Ohio.

• **Ralph M. Bixler** has been appointed sales manager, mill products, Phosphor Bronze Corp., Philadelphia. Mr. Bixler was formerly vice-president of Downs-Smith Brass & Copper Co., Inc.

• **J. C. McKenna**, formerly product manager, chromium chemical sales for Diamond Alkali Co., Cleveland, has been named product manager of alkali sales, succeeding **J. D. M'attern**, who has retired. **Charles F. Grant**, assistant to the president, Martin Dennis Co., Newark, N. J., has been named to succeed Mr. McKenna, since this manufacturer of chromium chemicals has been acquired by Diamond.

WHICH OF THESE BOOKS WILL BE MOST PROFITABLE TO YOU?

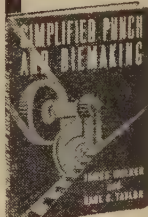
For ✓ new ideas ✓ the hard-to-find fact ✓ new processes ✓ the best material or method ✓ the underlying principle—and in many other ways these books can be helpful to you. Pick the ones you want most and **SEE THEM ON APPROVAL.**



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How to get your good ideas into production the best and easiest way.



Increase your production and profits with successful supervision.

Illustrated Jig-Tooling Dictionary

By T. G. Thompson and R. A. Peterson

988 working drawings, with concise explanations, show you at a glance what you want to know about the design and construction of any piece of tooling equipment. Here is a wealth of up-to-date useful data not only on jigs and fixtures but also on machine tools, diemaking, plastic molding, welding and allied tools and procedures. A very handy reference for production department personnel as well as toolmakers.

Powder Metallurgy

By Paul Schwarzkopf and Associates

The inventor of the multi-carbide hard metals, new sintered iron and steel products, and many of the other powder metallurgical products and processes presents here the first complete explanation of the characteristics, industrial processes, products and underlying theory of metal powders. A wealth of production information and the latest postwar developments are included.

Simplified Punch and Die Making

By James Walker and C. C. Taylor

This book by two expert toolmakers gives you the latest information on the methods and materials for the design and construction of all types of punches and dies used for fabricating sheet metal, together with clear how-to-do-it instructions. One tool and die maker of 30 years experience wrote that he found the book so informative and so interesting that he sat up nights reading it! Full reference tables are included.

Improved Foremanship

By Auren Uris

Conversations between a new foreman and his fellow workers bring out in specific, down-to-earth terms everything that a production supervisor must know to be successful and how he can best learn it. Foremen and top management people alike have put their stamp of hearty approval on this book as one of outstanding helpfulness and benefit to all concerned.

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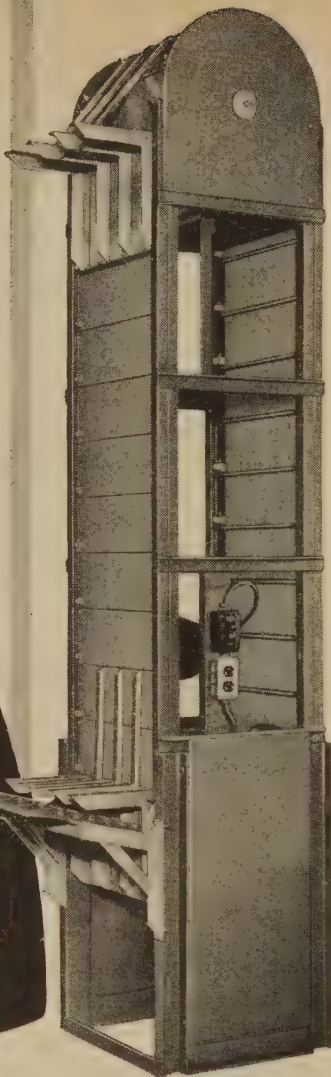
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PERSONALS

• Charles A. Neubling has been named director of electronics of the W. L. Maxson Corp., New York. He has formerly been associated with the Servo Corp. of America.

• E. H. Krieg has been appointed consulting engineer in the Boston office of Stone & Webster. He was formerly chief design engineer of the American Gas & Electric Corp.

• Seth L. Szeld has been appointed vice-president and treasurer, Edwal Laboratories, Inc., Chicago.

• C. G. Turner has been named director of the industrial relations department, Timken Roller Bearing Co., Canton, Ohio.

• William P. Gillespie has been appointed manager and Harold A. Stevens, assistant manager, of the new market requirements department of Henry Disston & Sons, Inc., Philadelphia.

• Dr. Ward Harrison has retired as director of engineering of the Lamp Dept., General Electric Co. Cleveland. Willard C. Brown has been appointed to succeed him.

• Harry H. Steck has been appointed Southeastern Div. sales manager, American Radiator & Standard Sanitary Corp., with headquarters in Washington. Ross H. Porter has been named assistant manager of the Pittsburgh office.

• Robert R. Rector has been named district representative for the Southern Div., American Coach & Body Co., Cleveland, covering the states of Alabama, Florida, Tennessee, Georgia, Mississippi and Louisiana, working out of the Atlantic area.

• A. H. Graham has been appointed manager, D-c Armored Motor Engineering Div. small and medium motor divisions, Erie Works, General Electric Co. Mr. Graham joined GE in 1939. He has been section engineer, design section of the D-c Armored Motor Div. since 1947.

• Jack A. Mansfield has resigned from Diamond Alkali Co. to be-

come a partner in the newly-formed Man-Gill Chemical Co., Cleveland. In his new venture Mr. Mansfield is associated with Vincent Gilliam, who heads Gilliam, Inc.

• L. G. Platt has been promoted to assistant division manager of the Minneapolis Sales Dept., Phillips Petroleum Co. Mr. Platt has been affiliated with the company since 1939 and previous to his new appointment has been a sales engineer in the Milwaukee office.

• Gordon E. Garnhart has been appointed director of the real estate and insurance division, Westinghouse Electric Corp., Pittsburgh.

• H. D. Solomon has been made assistant to the general manufacturing manager of the Lincoln-Mercury division, Ford Motor Co., Dearborn. G. S. Bergquist has been named Lincoln plant manager in charge of production.

• Louis E. Almgren has resigned as manager of works engineering and tool manufacturing of Talon, Inc., and has been appointed works manager of Webster-Chicago Corp., Chicago. Fred K. Keefer has been named chief works engineer and Gleason W. Starn superintendent of tool manufacturing.

• G. Luke Mizell has been appointed to the board of regional sales supervisors Eutectic Welding Alloys Corp., New York, covering the Middle and South Atlantic area of the United States.

• Donovan H. Tyson has been appointed controller and member of the finance committee of Sylvania Electric Products Inc., New York. Mr. Tyson, who has been a consultant for financial and general management since 1946, has previously been associated with U. S. Pipe & Foundry Co., Burlington, N. J.

Ryan Gets Order For Jet-Powered Aircraft

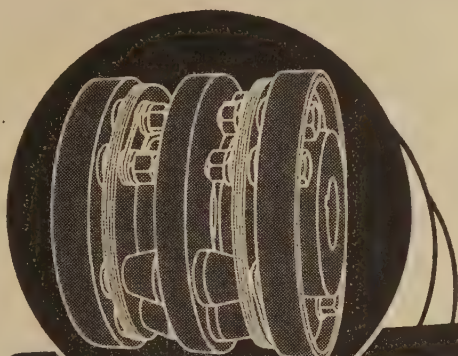
San Diego

• • • A major competition for the development and manufacture of a service test quantity of a jet-powered, high-speed, pilotless aircraft, to be used as a target plane,

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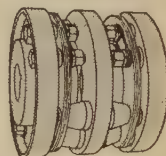
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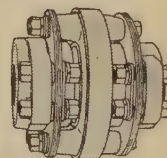
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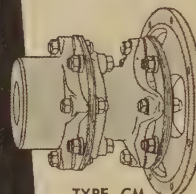
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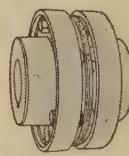
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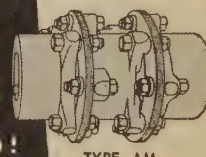
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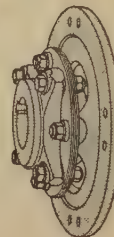
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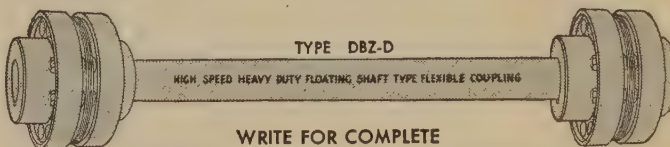
TYPE ST



TYPE AM



TYPE SS



TYPE DBZ-D

HIGH SPEED HEAVY DUTY FLOATING SHAFT TYPE FLEXIBLE COUPLING

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THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

HOW SIDE BARS FOR "Chabelco" DRIVE CHAIN



1/2" THICK
SIDE BAR FOR
"Chabelco"
DRIVE CHAIN

REAL
VIEW
O
DANLY
PRES

TIME
AND
COST-SAVING
FEATURES OF
DANLY
PRESSE

DANLY



ARE PRODUCED at a rate of **1200 per hour**

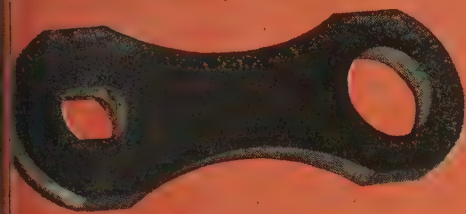
on a

DANLY

400-Ton

STRAIGHT-SIDE

PRESS



JOB DATA

Overall Size of Piece:

$6\frac{1}{4}'' \times 2\frac{1}{8}'' \times \frac{1}{2}''$.

Stock: SAE 1335 Steel—

$\frac{1}{2}''$ thick, $2\frac{1}{8}''$ wide.

Operations: Pierce one $1\frac{3}{16}''$

round hole and one straight-

side hole $1\frac{3}{16}'' \times \frac{5}{8}''$, trim

ends and sides.



(At left) Scrap is blown out of die through special shoot. Blanked pieces drop through cavity provided in bed of press. Power conveyor installed below bed discharges finished pieces in drum container.

- New Ventilated Floating Disc Air Friction Clutch increases flywheel energy—gives long, trouble-free service under severe operating conditions.
- Built-in Automatic Filtered Oiling System puts right amount of oil where needed—including flywheel bearings. Eliminates sludge—increases press life—conserves oil.
- Sturdy All-Steel Welded Frame—All weldments stress relieved before machining—insures accurate, permanent alignment.
- Pitman Wrist-Pin Design—Permits precision fitting of component parts, assures closer operating tolerances, promotes longer press life.
- Air Pressure and Oil Pressure Safety Switches—Safeguard press, prevent operation should pressures drop below safety point.
- Safe, Convenient Electrical Controls—Save time on die adjustments and add safety to trial strokes.
- Balanced Flywheel, Balanced Clutch and Air Counterbalanced Slide—Insure quiet, smooth-running performance.

One of nine Danly Presses at Chain Belt Co., Milwaukee, Wis., this 400-Ton, Straight-Side Unit speeds output of $\frac{1}{2}''$ thick side bars for "Chabelco" drive chain. A production rate of 1200 pieces per hour is attained with one operator at a press speed of 20 strokes per minute. The job is set up with a two-stage progressive die on a Danly Precision Die Set. Sixteen-foot lengths of $\frac{1}{2}'' \times 2\frac{1}{8}''$ SAE 1335 steel strips are fed by hand.

Tolerance of .003" held—Setup time reduced

The finished pieces are held to a tolerance of .003" on the hole centers. Accuracy of .010" is maintained around the blanked outline.

Setup time for this and other jobs is greatly reduced by reversible slide controls on the Danly Press. Because the press can be stopped at any point of its stroke *and quickly reversed* by push-buttons, die adjustments are made in a fraction of the time usually required.

Other important advantages

The Danly exclusive ventilated air friction clutch which contributes to flywheel energy, and the complete built-in circulating oil system are other important Danly features which help to further reduce press downtime, increase production, and cut costs.

DANLY MACHINE SPECIALTIES, INC.

2100 SOUTH 52ND AVENUE, CHICAGO 50, ILLINOIS



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Write today for free bulletin describing Danly's new and exclusive press engineering features. Find out how Danly Presses can help you cut costs and increase production. For free engineering assistance, send details about your problems. You will receive specific recommendations without obligation.



Is HANDLING a Help or a Headache?

MODERNIZE WITH TOWMOTOR MH*

*M H is Mass Handling, the systematic movement of the most units, in the shortest time, at the lowest cost.

Is yours a special handling problem? Let Towmotor engineers help you work out special equipment to meet your specific needs. Write for details.

The sturdy, compact Towmotor Model LT-35 handles loads up to 2,000 pounds, operates in complete safety in freight elevators and highway trucks and on upper floor levels where the load limits are restrictive.

Towmotor Mass Handling is a sure cure for handling "headaches." Towmotor Fork Lift Trucks, Tractors and Accessories, gasoline-powered for full-time, full-power service, will increase productive output, provide savings in time, money and space. On every operation, large or small, versatile Towmotor equipment provides all the benefits of modern handling techniques . . . lifting, transporting and stacking materials and products of almost any size, shape or weight . . . helping increase capacity of machines and manpower. And Towmotor Mass Handling is economical, too . . . that's why more professional handlers, the men who have to make handling pay a profit, use Towmotor than any other fork lift truck.



SEND FOR FREE BOOK!

New Towmotor Specification Folder contains complete information on all Towmotor Fork Lift Truck models. Send for free copy.



Plan to attend the 3rd National Materials Handling Exposition, Philadelphia, January 10-14, 1949.

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has been awarded to the Ryan Aeronautical Co. by the U. S. Air Force and the Navy.

Eighteen aircraft manufacturers and several other contractors were invited to make proposals and 14 actual designs and bids were submitted for the XQ-2 target plane order. It is a joint Air Force-Navy development project.

The XQ-2 is a pilotless jet plane, less than half the size of a standard fighter plane, which will be used as a target plane for both anti-aircraft gunnery and combat plane gunnery and interception problems.

Koppers Co. Sets Up New Section; Names Its Head

Pittsburgh

• • • The Engineering and Construction Div. of Koppers Co. has set up a new chemical section to supervise and coordinate engineering and construction work on contracts secured for the erection of plants to produce various gases, synthetic fuels and chemicals, according to Joseph Becker, vice president of the company.

T. M. Osborne who has been project manager of Koppers' \$4.5 million synthetic liquid fuels plant construction project in Louisiana for the government will head the new section.

Mr. Osborne came to Koppers a year ago as assistant manager of the Division's Control Section. Previously he was a Brigadier General in the U. S. Army Corps of Engineers.

Named Vice Consul

Savannah, Ga.

• • • Frank O. Wahlstrom, president of Southern States Iron Roofing Co., has been appointed Swedish Vice Consul in Savannah, Ga. The appointment was made by Sweden's minister of foreign affairs at the request of Lennart Nylander, Swedish consul general in New York, to fill the vacancy which has existed here since 1943.

Born in Eksjo, Sweden, in 1906, Mr. Wahlstrom left his native country in 1925 and settled in Jamestown, N. Y. From there he went to Birmingham, where he held various positions in the steel industry.

Close Scrutiny For England's Ordnance Factories Underway

London

••• An immediate review of the industrial capacity of the 22 government-owned ordnance factories and their 40,000 workers now producing commercial goods is called for by the Select Committee on Estimates—an all-party body set up by the House of Commons to look into government spending.

Civil work undertaken by the ordnance factories, says the committee, invariably shows a loss. Nearly all goods, from chemicals to laundry machinery, cost more than those produced by free enterprise firms.

Britain's nationalized railways refuse to buy railroad cars from the ordnance factories at present prices because free enterprise firms make them cheaper. Ordnance factories charge \$200 a car more than private builders and \$400 more than the railroad operating companies' own workshops. Gas cooking stoves, steel furniture and railroad sleepers are other items listed by the committee as being priced much higher than equivalent goods from non-government firms.

Rust Inhibitor in Oils Prevents Pipe Corrosion

New York

••• Research scientists of the Sinclair Refining Co. have developed an inexpensive rust-preventing compound that can be added to petroleum products to prevent corrosion of pipelines, according to company spokesmen.

Under this new process, all of the company's products such as gasoline, kerosene, heating oil and diesel oil will contain an effective portion of the rust inhibitor.

The action of the corrosion inhibitor is such that little more than 2½ gal. are required to provide rust preventing qualities to 43,000 gal. of petroleum products.

Patent applications covering the development have been filed and license agreements will soon make the use of this product available to other firms.

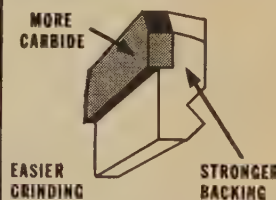
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WENDT-SONIS carbide tipped adjustable REAMERS



Design of Wendt-Sonis Adjustable Reamers assures outstanding performance of reaming operations. Cuts are smooth and true to close tolerances. Generous chip clearance allows maximum stock removal. Only selected materials, carefully heat-treated, are used in W-S Adjustable Reamers.

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W-S BLADE DESIGN



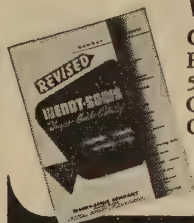
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ADJUSTABLE TO CLOSE TOLERANCES—Threads precision ground from the solid permit close blade adjustment. Maximum expansion allows greater number of re-grinds per tool. Special safety lock-nut permits easier replacement and positive locking of inserted blade.

AVAILABLE IN THREE STYLES—Straight shank, taper shank and shell type for reaming any type of material. Also available in right and left hand spiral flutes in straight and taper shank styles. A wide range of sizes for almost every reaming job.

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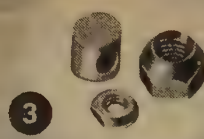
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DRILLS • END MILLS • FLY CUTTERS • TOOL BITS • MILLING CUTTERS • REAMERS
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1 AIRCRAFT PRODUCTS: AN Bolts, Nuts, Screws, Studs, Cotters (including Stainless Cotters)



2 SEMS—Pre-assembled Screw and Lockwasher units



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4 BICYCLE PARTS, from saddle bolts to chain-screws



5 FURNITURE BOLTS, Skein Nuts, Cabinet Bed Bolts and Bed Screws



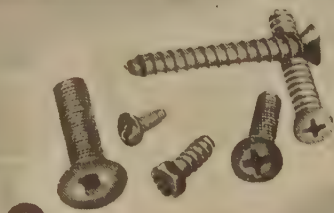
6 MILLED STUDS in a full range of sizes



7 DARDELET RIVET-BOLTS with locking thread . . . time sa for steel construction



8 WEATHER-TIGHT Bolts—modern fasteners for wood assemblies—eliminate counterboring



9 PHILLIPS and CLUTCH RECESSED HEAD Machine Screws and Sheet Metal Screws



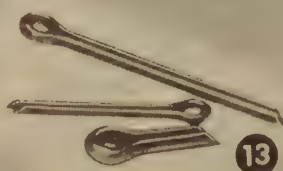
10 PLACE BOLTS—for locking assemblies rigidly



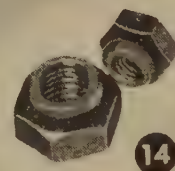
11 "1035" SET SCREWS of hi-tensile heat-treated steel



12 ROAD MACHINERY and other heavy equipment parts—high tensile and alloy fasteners



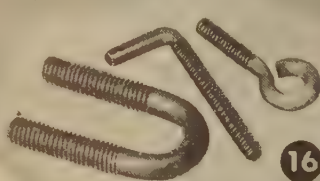
13 COTTER PINS of steel, brass, aluminum and stainless steel



14 LAMSON LOCK NUTS—One-piece, all-steel—can be re-used repeatedly



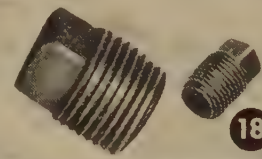
15 PLASTIC INSERTS—made to your specifications . . . in production quantities



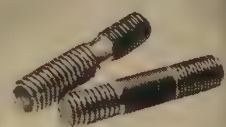
16 "BENT" Bolts, including U Bolts, J, L, Hook and Eye Bolts



17 WIRE ROPE CLIPS with the new Hi-Center Saddles and extra-strength U Bolts



18 PIPE PLUGS, square head and headless; forged steel, heat-treated



19 LOCK-THRED STUDS—Threads and seals in standard holes

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DON'T FORGET! Check the numbers on this coupon which correspond to the numbers of the fasteners above on which you wish more information.

20 "BOLTS, NUTS & SCREWS"—a compilation of technical articles on the manufacture, inspection, and use of fasteners; order from The Lamson & Sessions Co. at \$1.50 per copy.

21 "BOLT, NUT & RIVET STANDARDS"—a complete and up-to-date standards book on commercial fasteners. Available only from the American Institute of Bolt, Nut & Rivet Manufacturers, Hanna Bldg., Cleveland, Ohio. \$2.00 per copy.

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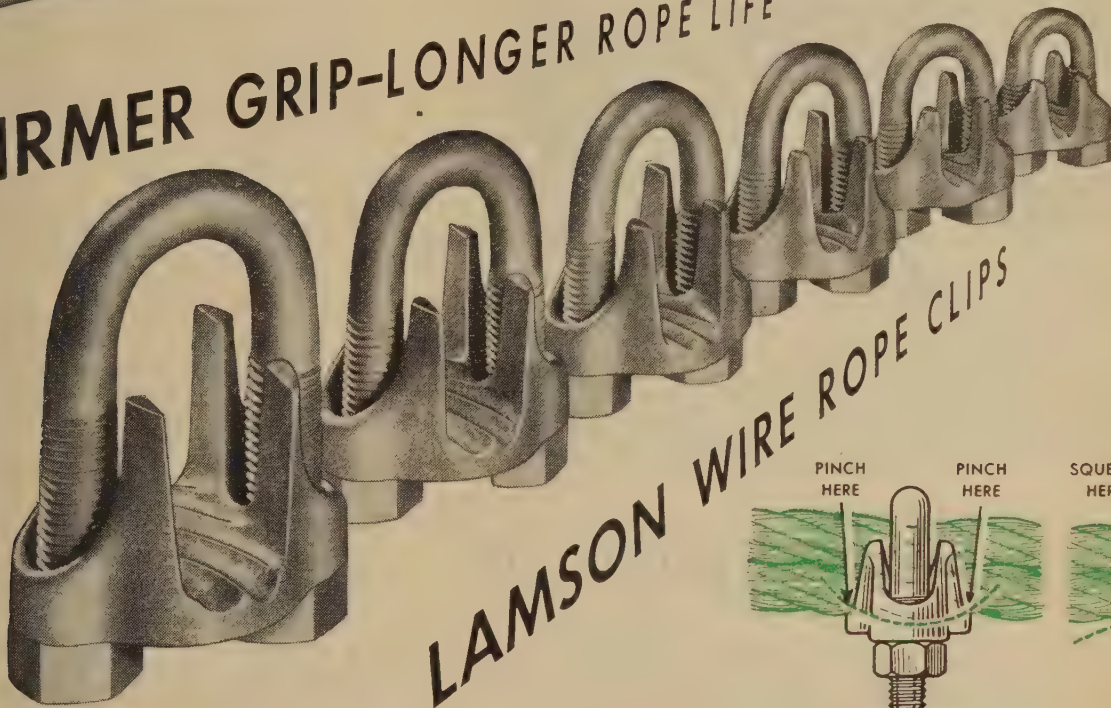
TS • CAI
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RAISED

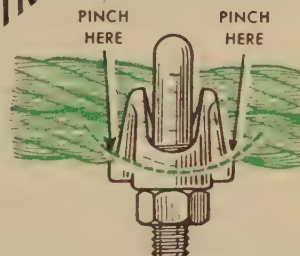
IN THE SADDLE!



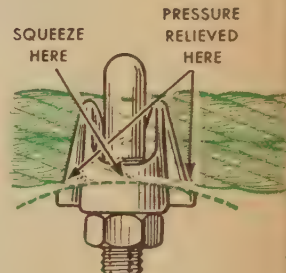
FIRMER GRIP—LONGER ROPE LIFE



LAMSON WIRE ROPE CLIPS



ORDINARY
DESIGN



LAMSON
"RAISED SADDLE"
DESIGN

LAMSON "Bull Dog" Wire Rope Clips perform like champions when "the squeeze is on". The secret of their efficiency lies in the exclusive "Raised Saddle" design which distributes the holding pressure along the center portion of the rope "seat". The edges of the saddle are rounded downward—thus eliminating the rope-wearing "pinch" and chafing of conventional clips.

The drawing above graphically illustrates the superiority of the Lamson "Raised Saddle" design. Note these outstanding and exclusive features:

1. Saddle curves downward at edges thus relieving pressure and "pinch" on wire rope . . . particularly when rope enters clip at an angle.
2. Clip is thicker, and therefore stronger, at cen-

tral, raised portion of the rope seat. This allows for greater tightening of the clip and a consequent stronger no-slip grip.

3. "U" bolt nuts will not tend to loosen up with use as with ordinary clips . . . even when the strain on the rope is released or reversed.

For the sake of safety, economy and efficiency, you'll be way ahead to specify Lamson "Bull Dog" Wire Rope Clips.

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Wyandotte Burnishing Compound 317 gives a high luster to parts of zinc, nickel and Monel metal. It works effectively in either hot or cold water. And because this viscous liquid contains no soap or inorganic alkalis, its burnishing action is not affected by the hardness of water. It rinses freely and leaves no scum on the work or in the barrel.

Wyandotte Burnishing Compound 320 gives a highly satisfactory finish to brass, copper, bronze, carbon steel or stainless steel. It is a soap-type compound and contains a non-toxic brightening agent. It may be used for burnishing with steel balls or for combined burnishing and burring with chips or stones.

Your Wyandotte Representative will be glad to tell you more about these and other specialized Burnishing Compounds in the *complete* Wyandotte line. All you have to do is give him a call.



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WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • SERVICE REPRESENTATIVES IN 88 CITIES

Discussions and Plant Tours Feature Meeting

Los Angeles

• • • A series of interesting discussions and plant tours have been arranged for the Semiannual Convention of the American Society of Tool Engineers scheduled here Oct. 11 to 13.

The meetings will be climaxed with a banquet Oct. 13. The featured speaker will be Kenneth T. Norris, president of Norris Stamping & Manufacturing Co., Los Angeles, talking on "Western Industrial Problems." Mr. Norris is well fitted to present the picture of industry on the Coast, Society Secretary Harry E. Conrad pointed out. "He has had years of experience as an executive and his wide participation in the activities of various businesses and industrial associations and institutes has given him an understanding of the overall situation."

The banquet will climax the 3-day semi-annual convention program. Built around the theme of "Progress on the Pacific," this meeting will feature technical sessions and tours of industrial plants in the Los Angeles area.

The technical session scheduled for Monday night, Oct. 11, will feature Hall L. Hibbard, vice-president and chief engineer, Lockheed Aircraft Corp. He will discuss aircraft development and jet propulsion in a talk entitled "Adventures in Space."

The Tuesday night session will consider "The Petroleum Industry—Tooling and Refining" with six leaders of the industry discussing phases of the business.

The schedule of tours is as follows:

Oct. 11—All-day tour of Lincoln-Mercury Assembly Plant, Ford Motor Co.; Los Angeles Harbor Area and Signal Hill.

Afternoon tour—U. S. Steel Products Co., American Can Co.

Oct. 12—All-day trip to Kaiser Co., Inc.; steel plant, Fontana. Afternoon tours—U. S. Electric Motors, Inc.; Firestone Tire & Rubber Co., Southgate Plant; American Can Co.; U. S. Steel Products Co.

Oct. 13—All-day tour of motion picture lots and beach area.

Afternoon tours—Aluminum Co. of America; Vernon Works; Owens-Illinois Glass Co.; U. S. Electrical Motors, Inc.

Sets Up Procedure For Barred Export Goods

Washington

••• The Economic Cooperation Administration has announced procedure for exports to participating countries of goods which have been denied export licenses.

The new policy decision stems from Section 204 of the ECA Appropriations Act. This section provides that whenever an export license has been denied or cannot be obtained for a commodity which was to be shipped to a non-participating country, under a contract entered into in good faith prior to Mar. 1, 1948, the ECA shall "provide for the procurement of such commodity to transfer to a participating country in accordance with the requirements of such country, at not less than the contract price," including any cost incurred in converting the commodity to meet the requirements of the participating country.

ECA says that the phrase "in accordance with the requirements of the country" means that procurement is to be arranged with respect to such stranded merchandise as can reasonably be made to fit the requirements of a participating country. Procurement for purposes of holding or scrapping is barred. ECA will transfer the commodity to the participating country, where such transfer can be arranged, at the cost of acquisition including any cost of conversion.

Two Indian Firms Ask For Loans for Expansion

London

••• The Tata Iron & Steel Co. of India is reported to have applied to the government for a loan of 200 million rupees while the Steel Corp. of Bengal has requested a loan for 170 million rupees.

In each of the cases the money will be used for modernization and plant expansion.

Tata asserts that if the loan is granted, it will be producing 600,000 tons of additional steel within the next 3 to 5 years.

The Steel Corp. of Bengal capacity will be increased 300,000 tons annually at the completion



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on Sleeve Bearings
AND SAVE MONEY!**

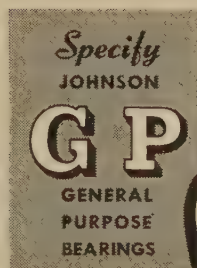
■ The trend in manufacturing circles today is toward STANDARDIZATION—away from specials. This is particularly true of Bearings. The machine designer has a golden opportunity to combine economy with efficiency by utilizing Johnson G. P. Standard Stock Bearings

From our list of over 850 sizes, the designer can secure at least 90% of his requirements from stock without delay. Every bearing is precision finished to standard tolerances, ready for immediate installation. Large production runs provide a low unit cost and every bearing is cast from the highest quality bronze alloy available

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JOHNSON BRONZE CO.

505 South Mill Street — New Castle, Pa.



Branch Offices

of the first part of its expansion program and by 1 million tons annually at the completion of the third and final stage. The plan extends over a span of 6 years.

Steel Exports Drop In June; Expect a Steady Climb Last 6 Months

Washington

• • • The Commerce Dept. has reported that exports of iron and steel dropped in June to a new low level for the year.

The month's total was 341,730 net tons, thus bringing the total export tonnage for the first six months of the year to 2,457,408 net tons.

But the Economic Cooperation Administration and the Commerce Dept. predict that exports of iron and steel will begin a steady upward climb in the last six months of this year. The June export figure is believed to reflect a period of relative inactivity.

Tin plate and tagger's tin were, for the second consecutive month, exported in larger quantity than any other steel commodity. These two products accounted for 41,323 net tons during the month. Black steel sheets again accounted for the second largest quantity—31,678 net tons. Net tonnages of iron and steel commodities exported during June are:

Ingots, blooms, billets, slabs, sheet bars, 14,188; wire rods, 2260; skelp, 5728.

Iron bars, 384; concrete reinforcement bars, 9919; steel bars, cold finished, 3190; other steel bars (excluding alloy), 21,262; alloy steel bars, 4821; welding rods, electric, 1159.

Boiler plate, 2159; other plates, not fab, 22,684; plates, fab, punched or shaped, 4283; iron sheets, black, 1558; steel sheets, black 31,678; galvanized sheets, 6280; strip steel, cold rolled, 4051; strip steel, hot rolled, 4144; tin plate and tagger's tin, 41,323; terne plate (incl. long ternes), 936.

Structural shapes, plain, 27,897; structural shapes, fab, 18,050; frames and sashes, 241; sheet piling, 1979.

Rails, 60 lb. per yard and over, 21,111; rails, less than 60 lb. per yard, 1745; rails, relaying, 7128; splice bars and tie plates, 1990; frogs and switches, 222; railroad spikes, 610; railroad bolts, nuts, and washers, 806; car wheels, tires and axles, 4581.

Seamless black pipe, 1378; seamless casing and oil line pipe, 24,123; seamless boiler tubes, 3488; welded black pipe, 4944; welded galvanized pipe, 3457; welded casing and oil line pipe, 3127; welded boiler tubes, 195; other pipe and fittings, 3710.

Plain wire, 5338; galvanized wire, 4344; barbed wire, 2287; woven wire fencing, 424; woven wire screen cloth, 526; wire rope and strand, 1049; wire nails, 1671; other wire and manufactures, 4691.

Horseshoe nails, 13; tacks, 295; other nails, incl. staples, 1261; bolts, nuts, rivets and washers, except railroad, 5159; forgings, 1872; horseshoes, 11.

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WE'RE PROUD of the diversified controls, instruments, appliances and other temperature-responsive devices which use Chace Thermostatic Bimetal as the actuating element. Every issue of many industrial journals tells product engineers who specifies Chace Thermostatic Bimetal, and how — and why! Look for this informative series of Chace advertisements; it may suggest new uses of thermostatic bimetal in your products.

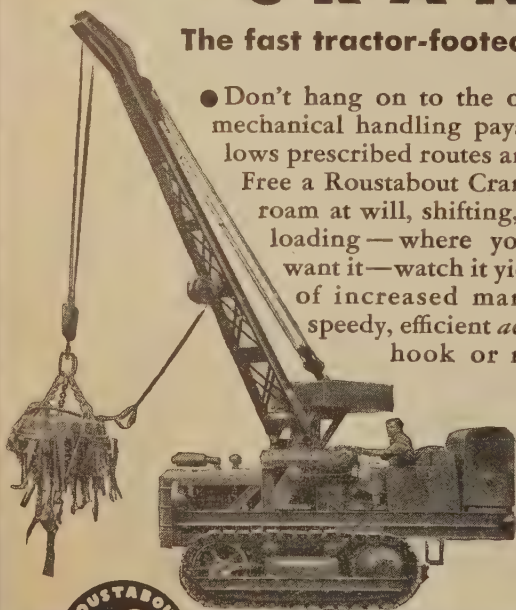
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The fast tractor-footed load-hustlers

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DELAWARE, OHIO, U. S. A.

Load-Handling Specialists since 1904

Organizes Efforts To Reduce Freight Losses

Washington

••• The porcelain enamel industry is making a concerted effort to reduce freight losses and rates through a packaging and shipping standardization program, according to the Porcelain Enamel Institute.

R. F. Bisbee, manager of quality control for Westinghouse Electric Appliance Div. at Mansfield, Ohio, was named general chairman and head of the main Coordinating Committee.

The committee's aim, Mr. Bisbee explained, is to formulate a standard pretransportation test procedure which the porcelain enamel product manufacturer can use in his own plant to assure that his package and product will withstand normal transportation hazards without damage.

In order to standardize such a procedure, Mr. Bisbee points out, suitable test equipment and testing specifications must be developed to the satisfaction of both the porcelain enamel manufacturers and the carriers.

Radioactive Tracers Show Efficiency of Fertilizers

Washington

••• Only minute quantities of radioactive materials is necessary for tracer studies of plant nutrition, it was reported here at the 114th national meeting of the American Chemical Society.

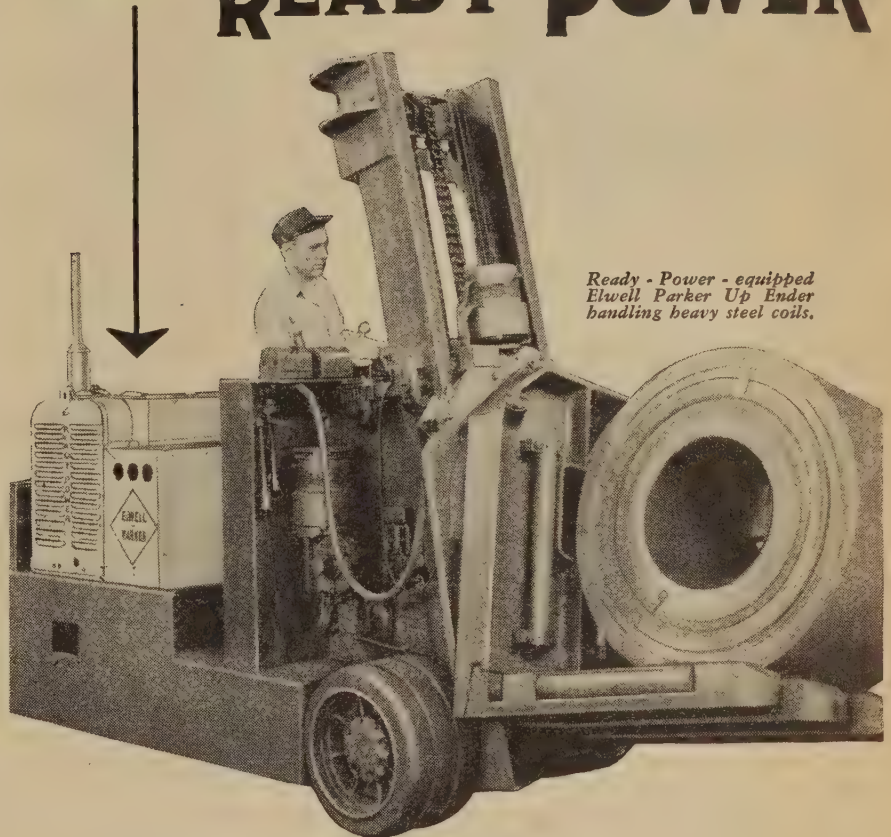
Radioactive phosphorus is necessary only in the amount of 1.5 to 3 parts per billion of total phosphorus to make possible experiments lasting throughout a growing season of 5 to 6 months, according to three chemists from the Dept. of Agriculture.

The use of radioactive phosphorus as a tracer to determine the amount of phosphate used by growing plants affords a means for comparing the efficiencies of different phosphates, superphosphates, dicalcium phosphates, etc., on both fertile and unfertile soil.

Heretofore, efficiency of fertilizer could be made only on unfertile soil although the bulk of commercial fertilizers are actually applied to relatively fertile soils.

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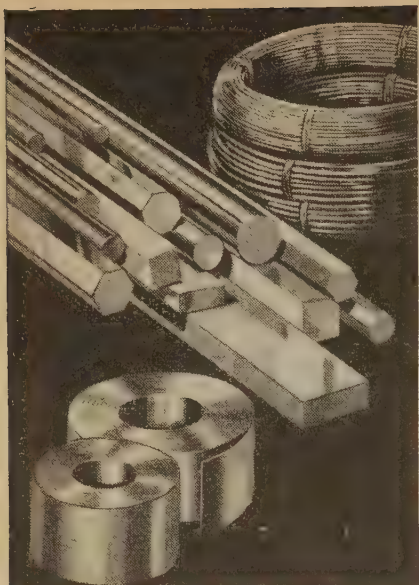
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**British Exhibition of
Machine Tools Valued
At About \$80 Million**

London

• • • The first exhibition of machine tools to be held in Britain since 1934 is now running at Olympia, London. Exhibits valued at over \$80 million are being shown and the display is being visited by many buyers from inside Britain as well as from America and the European continent. Business so far seems to be very satisfactory.

The great improvements in finish and precision made during the last decade are at once apparent and the visitor cannot fail to notice the general high standards achieved by all exhibiting firms. Machine tool makers from outside Britain are well represented and a representative number of machines of American design are shown as well as some of the best Continental machines. Among the American machines that drew particular attention were some milling machines by Kearney & Trecker and some C.V.A. dieing-presses.

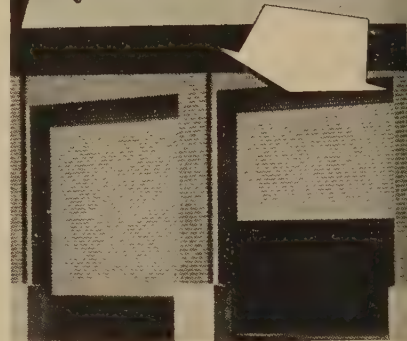
A general trend towards more extensive incorporation of electronic and hydraulic controls is noticeable, making for a more accurate control of speed variations and easier setting of machines, thus reducing operator fatigue. An interesting feature is the attempt by a number of firms to standardize control equipment fitted to various types of machines.

A notable example in this field is shown by the well-known British firm of grinding-machine makers, the Churchill Machine Tool Co., Ltd., who have designed a universal control unit to be fitted in a front apron to the various grinding machines made by this firm. The advantages of this method from a point of view of production are evident. Flow-production techniques can be adopted and tooling-up for production is simplified. From the users' point of view, the necessity of stocking only one type of spares for a number of different machines considerably reduces store room difficulties and the use of one standard control unit facilitates training of operators.

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That fluorescent lighting in the factory has come to stay cannot be doubted by anyone who has seen the extensive application of selected finishing shades to the machines exhibited. In general it can be said that designs show a decided cleaning up of line and many tools show, what is called by the manufacturers, "the new look." Essential working parts, such as gears, controls, etc., are almost universally enclosed, giving protection against dirt and damage and hence assuring greater precision, this being the general object in all designs.

Wide application of carbide-tipped cutting tools is also apparent and manufacturers have been quick to take advantage of the possibilities offered by these tools to extend the use of negative rake cutting, which is now becoming very prominent.

Generally, the exhibition is considered to be very successful and buyers from outside Britain have repeatedly shown their appreciation of the standards set. Numerous machines are being quoted for delivery in a matter of weeks. Two years is still quoted in some instances, but, generally, delivery dates have been greatly reduced.

Opening the exhibition, Mr. George Strauss, Minister of Supply, said that the total output of new metalworking machine tools this year was almost certain to exceed \$120 million worth, compared with only \$26 million in 1935. Woodworking machines were expected to reach \$20 million this year, against \$4 million in 1935. The minister would not accept the argument that by sending machine tools abroad, British manufacturers, by re-equipping the industries of other countries, were enabling them to compete. He pointed out that prosperity could be achieved nowhere without a measure of industrial productivity.

"Deliberately to prevent other countries achieving industrial prosperity by refusing to sell them the machine tools they needed would not only be wholly ineffective in that others would eventually provide the machine tools held back, but would be contrary to British basic policy of maximizing the flow of world trade between all countries," Mr. Strauss said.

Photograph, courtesy of The Hydro-Electric Power Commission of Ontario.



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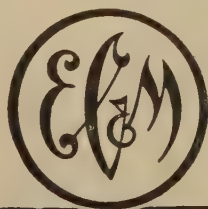
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NEWS OF INDUSTRY

Prompt Action Needed For U.S. to Get More Of German Scrap Metal

Coatesville, Pa.

• • • Prompt steps must be taken to remove all obstacles in the way of establishing an effective plan of action by American interests if the United States is to obtain more scrap steel from Germany, according to Robert W. Wolcott, president of the Lukens Steel Co.

Mr. Wolcott recently returned from a trip to Germany as chairman of the Committee on Iron and Steel Scrap of American Iron and Steel Institute and the Steel, Foundry and Scrap Industries' Committee for Expediting Iron and Steel Scrap.

He made the trip at the request of Secretary of Commerce, Charles Sawyer.

Immediate establishment of a single scrap purchasing and selling organization to act in cooperation with the British as to all scrap to be exported from Germany was recommended by Mr. Wolcott. He stated that the scrap needs of the sixteen nations which will be given aid by the United States should be recognized in order that they might maintain essential steel production.

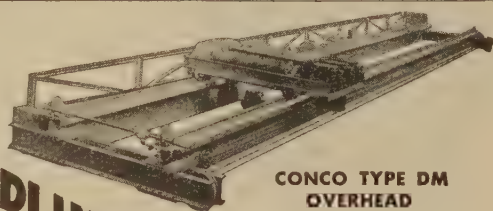
Enough scrap exists in Germany to support an extensive export program as well as to supply the needs of the German steel industry. A lack of understanding between the American and British Military Governors on several important points is one retardant to the immediate exportation of scrap from Germany, Mr. Wolcott reported.

Some of these points include the question of the proper percentages of the scrap which would go to the United States, the inclusion in any consideration of future allocations of the amount of scrap removed by the British as war booty, plus the amounts commercially contracted for, the definition of booty scrap, and the question of the proper prices for scrap export sales.

According to Mr. Wolcott, discussions are now taking place to resolve these differences, and if the discussions are satisfactorily concluded, there should be an impressive and continuous flow of scrap from Germany to the United States.

Necessary steps also include a requirement that German scrap deal-

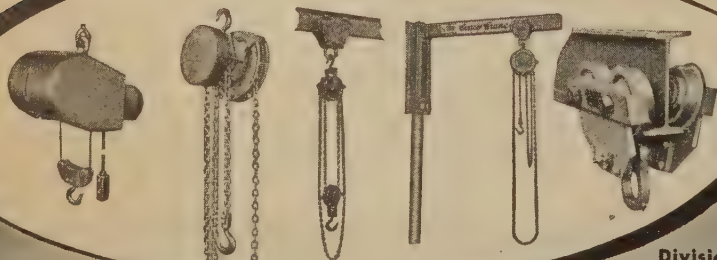
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ers honor their contracts and that stipulations be adhered to in order to eliminate interference and control of scrap transactions by private German associations of a cartel-like nature.

"There must be improved control and supervision of the entire scrap program, either under the Bipartite Control Office, or some other means," said Mr. Wolcott. "There is an urgent need for experienced and competent personnel under the American Military Government."

Mr. Wolcott recommended that the allocation of German scrap as among the participating claimant nations should be ascertained on the true need of all countries, using their prewar production of ingots as a basis.

Nickel Production In Canada Progresses at Near Record Output

Toronto

• • • With Canadian nickel production averaging approximately 11,500 tons per month for the first half of this year, indications are that output for the full year of 1948 will be very close to the high record of 144,010 tons established in 1943. Production of nickel dropped to a 10 year low of 95,405 tons in 1946, but amounted to 117,780 tons in 1947.

Almost as important as the increase in production of base metals is the impressive growth of plants engaged in the domestic fabrication of miscellaneous products from crude ore and the lesser proportion of ores exported. At present about 45 pct of the copper mined in Canada is fabricated in this country as compared with 20 pct in 1938.

Approximately 37 pct of the lead mined, 20 pct of the zinc and 8½ pct of the nickel are now fabricated in Canada against 12 pct, 10 pct, and 5 pct respectively in 1938.

Average monthly production of copper in Canada for the first 6 months this year was approximately 20,450 tons compared with monthly average of 18,775 tons in 1947 and 15,330 tons in 1946. Zinc output in first half averaged about 18,664 tons a month against 17,783 tons for the 1947 period and 19,609 tons for 1946.

On the other hand lead produc-

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tion has dropped to around 12,420 tons as the monthly average this year compared with 13,500 tons for 1947 and 14,588 tons for 1946.

The decline in lead output was due to various causes such as labor and power shortages, a thinning out of veins, exhaustion of orebodies and increased concentration on the mining of zinc. However, with Canada giving special attention to the discovery of new lead deposits, it appears likely that 1949 again will see production of this metal on the upgrade.

Canada's Exports Up \$14.3 Million Over The Preceding Month

Ottawa

• • • Canada's export trade in July increased \$14,300,000 to a total of \$250,900,000 compared with \$236,600,000 for July 1947, according to the Dominion Bureau of Statistics. The sale of ships and vessels largely was responsible for the increase in July, jumping from \$139,000 in July last year to \$17,195,000 this year. Most of the sales were of new ships of which France purchased \$12,450,850; Brazil, \$2,778,686; Denmark, \$1,225,000 and Hong Kong, \$725,000.

July totals showed a further gain in exports to the United States, a continuation of the decline in exports to the United Kingdom and augmented exports to Latin American countries as a whole.

Improvement was noted in exports of nonferrous metals in July which rose to \$30,930,000 from \$28,655,000 for July last year, with copper and products, lead and products, nickel, precious metals, except gold, zinc and products all showing increases. The iron and products group showed little change, standing at \$23,204,000 compared with \$23,703,000 last year.

Also there were increases in rolling mill products, farm implements and machinery, freight automobiles, and railway cars and parts. Declines were noted in ferroalloys, machinery, other than farm, passenger automobiles and automobile parts.

Exposition to Feature Postwar Developments Of the Steel Industry

Cleveland

• • • The 1948 Iron and Steel Exposition and Convention at Cleveland, Sept. 28 through Oct. 1, will highlight extensive postwar developments of the iron and steel industry, according to A. J. Fisher, president of the Assn. of Iron and Steel Engineers.

"The efforts throughout the industry have been directed so exclusively to meeting ever-growing production demands," Mr. Fisher pointed out, "that there has been little time devoted to publicizing those developments which have made possible today's record production."

One outstanding development to be pointed up at the convention is the new Jones & Laughlin tandem cold strip mill. With only a very brief history of a year, this mill has come to be known as the "fastest rolling mill in the world." The design and operating method of this mill, which rolls over 6200 ft of tinplate per minute, will be revealed in detail.

Another equally interesting development to be presented formally for the first time is the startling low coke rate achieved at the new blast furnace of the Kaiser Steel plant, Fontana, Calif. Only a few times during the past 18 months has the coke rate at Fontana exceeded 1450 lb per ton of iron. This rate is not only low for California where the production of good metallurgical coke has always been a problem, but it is low for other sections of the country as well.

Also scheduled for discussion will be improved, redesigned bearing seals which are a direct outgrowth of today's increased working pressure and the development of hydraulic devices in industry.

Among other important revelations will be: water works maintenance in the steel industry; fuel oil supply; natural gas reserves, and a newly designed, mandrel type hot strip mill.

Plant superintendents and operations men will find two exhibits featuring air conditioned crane

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cabs particularly interesting. One of the most progressive steps in the direction of improved industrial relations and efficiency, mechanical refrigeration of these vehicles also serves as bona fide accident insurance.

Mechanical refrigeration developed for these cabs can reduce the temperature of cabs operating in areas of radiant heat to 80 or 85°F. Additional advantages of air conditioning, including its ability to reduce concentrations of carbon monoxide gas in crane cabs, are also claimed.

Also vollying for the spotlight in the Exhibition Hall, and the particular attention of the electrical men, will be a small model crane which is operated by a full size dynamic lowering hoist control panel and a six point master switch. More than 250 booths sponsored by 134 companies and corporations will be on display in the Hall.

Buys Drydock for Ship Repair and Conversion

Philadelphia

... The Cramp Shipyard at Port Richmond has been leased from the Navy for a period of 5 years by the Delaware River Shipbuilding & Drydock Corp. for use in ship repair, conversion and wrecking operations. Eventually the operating company, whose president is Jack G. Buncher of Pittsburgh, expects to be in a position to build ships there.

The drydock at the Cramp yard is one of the three largest in the country, having been built by the Navy in 1943 at a cost of \$7 million. The dock is 645 ft long and 90 ft wide and can accommodate the largest tankers and merchant ships.

For some time now the company has been operating a portion of the yard for shipwrecking operations but scrap interests say they have had no ships available for the last month. Mr. Buncher, whose company is incorporated at Baltimore, said that considerable ship repair work had already been lined up. A survey of North Atlantic shipping operators has indicated to the management that a definite need exists for ship repair and conversion facilities here.

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Gray Iron Founders To Hold Yearly Confab

Cleveland

• • • Gray Iron Founders' Society will hold its 20th annual meeting at Haddon Hall, Atlantic City, N. J., Oct. 14 to 15.

An informative business program has been arranged, and the entertainment committee has been planning events for those who attend.

The tentative business program follows:

Thursday, Oct. 14

8:30 a.m.—Registration

10:15 a.m.—Business Session

Remarks of society president: Howard A. Stockwell, Barbour Stockwell Co., Cambridge, Mass.

Reports of Committees: Henry J. Trenkamp, Ohio Foundry Co., Cleveland

Executive vice-president: Raymond L. Collier

Technical and research director: Charles O. Burgess

Advertising Committee: E. C. Hoenicke, Easton Mfg. Co., Detroit

Cost Committee: A. E. Hageboeck, Frank Foundries Corp., Moline, Ill.

Technical Committee: E. B. Sherwin, Chicago Hardware Foundry Co., North Chicago, Ill.

Terms and Conditions of Sale Committee: P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, Ohio.

Foundry Education Foundation: J. M. Price, Ferro Machine & Foundry Co., Cleveland
12:30 p.m.—Industry Luncheon

Presentation of retiring board of directors
"Rating Better People in our Foundries," William B. Given, American Brake Shoe Co., New York

2:30 p.m.—Symposium on Foundry Hygiene
"Silicosis in the Foundry Industry," A. E. Hamlin, M.D., American Brake Shoe Co., Chicago

"Building Healthful Working Conditions into the Foundry," Theodore F. Hatch, Industrial Hygiene Foundation of America, Pittsburgh

"Legal Aspects of Compensating Disability Caused by Silicosis," Theodore C. Waters, Mullikin, Stockbridge & Waters, Baltimore

4:00 p.m.—Committee Meetings.

5:30 p.m.—Social Hour

Friday, Oct. 15

9:00 a.m.—Registration

10:00 a.m.—Business Session

"Profit-Sharing and the Free Enterprise System" Robert S. Hartman, Council of Profit-Sharing Industries, Wooster, Ohio

"Security Must Be Earned," H. C. Nicholas, Quality Castings Co., Orrville, Ohio

"The Pig Iron Situation—Past and Present," John A. Claussen, Merchant Pig Iron Committee, American Iron & Steel Institute, New York

"Education Program for Foundry Personnel," James H. Smith, Central Foundry Division, General Motors Corp., Saginaw, Mich.

12:30 p.m.—Industry Luncheon

Introduction of new board of directors

Introduction of new officers

Presentation of citations and awards by H. A. Stockwell, society president. One mold medal and four awards in scroll form will be made.

Speaker: Harold Hoffman, former governor of New Jersey

Adjournment

French Modernization Program Continues To Make Rapid Progress

Paris

• • • A second report on the French Equipment plan indicates that outside of construction of new coking plants and power stations, main efforts have been devoted to increasing capacity to make flat-rolled products and attempts to reduce fuel consumption and manpower requirements.

Substantial progress has been made in the erection of a hot strip mill at Denain and a cold finishing mill at Montataire. Much of the equipment for these mills was received from the United States.

No decisions have been made to actually start work on the construction of a second set of mills in the East, although many proposals have been made to public authorities.

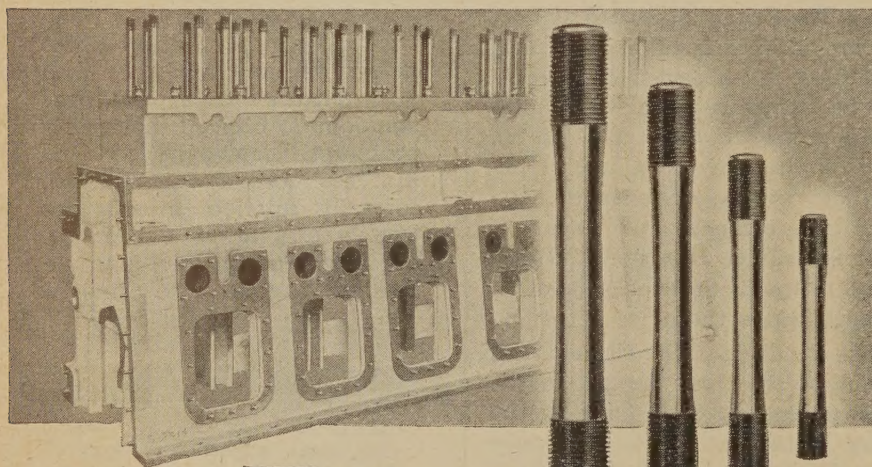
Other plans for hot and cold rolling mills for the North are in progress. About 10 mills have been ordered from the United States for this area. Other mills from Belgium and Britain are also expected. It is believed that operation of some of these mills will begin between late 1948 and sometime in 1949.

Sintering equipment is also in heavy demand. The Greenawald plant has been built at Mont Saint Martin and another at Micheville. They are expected to be operating by late this year.

Six new blast furnaces have been ordered. They will be constructed at Valenciennes, Senellange, Micheville, Mont Saint Martin, Rombas and Hayange.

Four other blast furnaces will be built at Hayange, Moyeuvre-Thionville and Uckange. Two blast furnaces which were damaged during the war have been rebuilt at the Mondeville Iron Steel works and several others have been relined recently.

Four openhearth furnaces are under construction at Beaufort-Hautmont, Hayange and Sanellange. The first two will be oil fired. Other openhearths at Hannebore, Basse Indre and Firminy will be converted from gas to oil fired units, while the furnace at Pomiery will continue to be fired with natural gas.



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Schedules Review Of Bearing Seal Design At Steel Convention

Cleveland

• • • Since the development of hydraulic devices in industry and the increase in working pressure, there has been a corresponding increase in premature bearing failure through the inability of bearing seals to exclude outside contamination, according to R. A. Kraus, Republic Steel Corp.

The importance of carefully selecting and fitting the proper bearing seal design will be reviewed by Mr. Kraus at the Iron and Steel Convention here from Sept. 28 to Oct. 1.

In pointing out the details to be considered in bearing protection, Mr. Kraus will discuss the surface finish of the mating members; methods of seal assembly; interference fit of the seal in the housing; provisions for pressure relief where necessary; amount of shaft runout permissible; optimum shaft hardness; provisions for seal lubrication and other factors which are of major importance in obtaining the desired life cycle of the sealing device.

Kelly Award Winner To Speak on Roll Design

Cleveland

• • • Ross E. Benyon has selected roll design as the subject for his talk to be given at the Iron and Steel Exposition and Convention held here from Sept. 28 to Oct. 1. Mr. Benyon is again the Kelly Award winner for 1948, having previously held the same distinction in 1946.

His current paper will be entitled "Beam and Channel Roll Design." It is intended principally to help acquaint beginners in roll design with the ways of rolling beams and channels, and the reason for selecting the particular type of design.

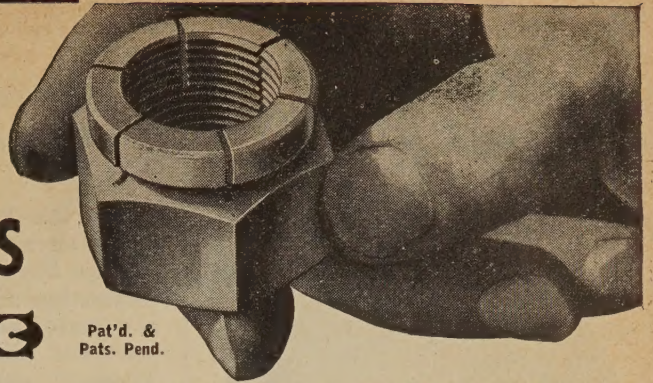
The first three parts of the paper trace the developments of beams and channels while the fourth part considers the development of universal beams from the earliest beginning to the present time.

Drawings are shown of the principal types of universal beam mills.

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Sizes from #6 to 2" in diameter—in "regular" and "thin" types—in NC and NF thread series. Write for "Flexloc" Catalog.

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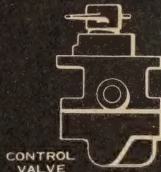
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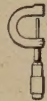
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**ECA Plans Stockpiling
Of Strategic Materials**

London

• • • An Economic Cooperation Administration group which has been in Paris discussing means of increasing production of strategic raw materials has arrived here to continue discussions with the Treasury and the Colonial office. After discussions in London, the group will go to the Hague and then back to Paris.

The talks in the 3 capitals have been described as exploratory. They are primarily to consider with officials of the various countries and with ECA country missions methods of expanding production of strategic materials and the extent to which any ECA assistance may be necessary. This aid may include furnishing equipment and other facilities needed to stimulate production.

The United States wishes to purchase for stockpiling strategic materials that are short in supply there. Among the materials which it is said the United States wishes to acquire are chromite, antimony, manganese, lead, tin, copper and graphite. Most of these materials are expected to come from French and British colonies.

**Japan Purchases Iron Ore
From A Canadian Company**

Vancouver, B. C.

• • • The Japanese Board of Trade has placed a contract for 250,000 tons of iron ore to be mined at Texada Island, British Columbia, and to be shipped to Japan, D. S. Tait reported.

Mr. Tait, president of Privateer Mine Ltd., personally holds the option on the Texada Island property and says: "The matter is definite, although there are some details to attend to, and we hope to have the deal finalized this week."

W. L. Leo, president of the China Mutual Trading Co., Seattle, also confirmed the contract and says he expects that the ore will be shipped to Japan in Canadian ships.

The contract will involve the construction of a deep-sea wharf and the installation of a large mining plant.

The Texada property lies in the Gulf of Georgia, between Powell River on the B. C. mainland and Nanaimo on Vancouver Island. The property is owned by the Puget Sound Iron Co. of San Francisco, with Mr. Tait holding the option.

BUBBLEOMETER: Bell Aircraft engineers determine the thickness of this plexiglass helicopter cockpit cover through an electronic skin test with a thickness gage that resembles an electric razor. The instrument is claimed to be sensitive enough to detect a 5 pct variation in thickness.

